WASHINGTON'S SPECIES OF GREATEST CONSERVATION NEED: CONSERVATION ACTIONS

MAMMALS

Preble's shrew	Biology and Life History	Population	Distribution
Sorex preblei	forest floor insectivore	Species status in Washington is unknown	Only recorded from limited area of the Blue Mountains in Garfield County in habitat atypical for species
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	small, isolated population vulnerable to extinction	Determine status	Conduct trapping surveys at historical sites

White-tailed jackrabbit	Biology and Life History	Population	Distribution
Lepus townsendii	Herbivore inhabiting open shrub-steppe	declining	Limited to Columbia Basin and Plateau in WA
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Habitat, Habitat loss	Conversion of shrub steppe to cropland; overgrazing	Conserve suitable habitat	
Disease; Limited distribution	disease may be repsonsible for recent decline	Test and monitor for disease, Population monitoring and research,	assess need of reintroductions
Lack of information	jackrabbits have undergone mysterious declines	determine status	Determine and map distribution; investigate cause of declines

Black-tailed jackrabbit	Biology and Life History	Population	Distribution
Lepus californicus	Herbivore inhabiting shrub steppe	declining	Limited to Columbia Basin and Plateau in WA
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Conversion of shrub steppe to agriculture	Conserve suitable habitat,	Management agreements,
Disease; Limited distribution	disease may be repsonsible for recent decline	Test and monitor for disease, Population monitoring and research,	Assess need of reintroductions
Lack of information	jackrabbits have undergone mysterious declines	Determine status	Determine and map distribution; investigate cause of declines

Pygmy rabbit	Biology and Life History	Population	Distribution
Brachylagus idahoensis	Herbivore inhabiting sagebrush habitat with deep soils	critically low population; remaining individuals captured for captive breeding recovery project.	Was limited to small area in Douglas co., before being placed in captivity. No known individuals occurring in the wild.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Severe population decline	Small population size	Increase distribution	Reintroduce sufficient numbers through captive breeding
Loss of deep soil sagebrush habitat	Loss of genetic diversity	Restore degraded habitats	Increase amount and connectivity of suitable habitat

Olympic marmot	**Biology and Life History**	**Population**	**Distribution**
Marmota olympus	Herbivore inhabiting alpine parklands with rock slide, boulder piles, herbaceous vegetation, and few to no trees	Exists largely in protected areas of Olympic National park and National forest	Limited to high elevation areas of the Olympic Mtns
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution	Human disturbance and potentially increase rate of predation as caused by visitors feeding coyotes at visitor areas near marmot colonies	Monitoring and reseach of populations and habitat.	Control and monitor disturbance.
Limited habitat	demographic and genetic affects of small population size and metapopulation structure.	Determine Status	Develop survey protocol

Townsend's ground squirrel	**Biology and Life History**	**Population**	**Distribution**
Spermophilus townsendii townsendii	Shrub-steppe species, found in small to large colonies, hibernates up to 8 mo./year	Believed to be declining; extirpation of some historical populations	Endemic to southcentral Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Data on population and habitat trend lacking, but suspect both are declining	Determine status; test and monitor for disease	Undertake field surveys for presence and abundance
Harvest	target shooting (plinking)	Education and outreach;	Add to list of protected wildlife
Development; Habitat loss	urban and rural sprawl, conversion and degradation of sagebruch habitats	Monitoring and research on habitat	Gather basic information on habitat use/selection, habitat condition.

Townsend's ground squirrel	**Biology and Life History**	**Population**	**Distribtuion**
Spermophilus townsendii nancyae	Shrub-steppe species, found in small to large colonies, hibernates up to 8 mo./year	Size unknown but probably declining.	Endemic to southcentral Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Data on population and habitat trend lacking, but suspect both are declining	Determine status, test and monitor for disease	Undertake field surveys for presence and abundance
Harvest	target shooting (plinking)	Education and outreach;	Add to list of protected wildlife
Development; Habitat loss	urban and rural sprawl, conversion and degradation of sagebruch habitats	Monitoring and research on habitat	Gather basic information on habitat use/selection, habitat condition.

Washington ground squirrel	Biology and Life History	Population	Distribution
Spermophilus washingtoni	Shrub-steppe species, found in small to large colonies, hibernates up to 8 mo./year	Size unknown but declining.	Endemic to southeastern Washington and northcental Oregon.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Conversion to agriculture and development, and fragmentation of habitat may isolate remaining populations	Monitoring and research of habitat	Use land acqusitions, conservation easements, and landowner agreements to protect significant colonies, and increase habitat connectivity.
Invasive plant species	Cheatgrass invasion and fires	Restore degraded habitats	Manage degraded habitat at colonies.
Harvest; illegal target shooting (plinking)	Illegal target shooting continues despite legal protection	Education and outreach; Control and monitor disturbance; enforce existing protective regulations	Efforts are needed to reduce the amount of illegal shooting.
Lack of information	Causes of recent declines uncertain	Determine Status; Research into causes of recent declines, test and monitor for disease	Conduct research on current status and causes of decline.

Western gray squirrel	Biology and Life History	Population	Distribution
Sciurus griseus	Habitat specialist tree squirrel, strongly associated with oak/ponderosa pine or oak/douglas fir forests	Historical declines; occurs in 3 isolated subpopulations;	Limited to 3 subpopulations: Klickitat County, southern Okanogan-eastern Chelan Cos., and Fort Lewis in Pierce County.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Timber harvest, fire,residential development	Conserve suitable habitat, Habitat and population monitoring and research	Protect areas with concentrations of squirrel nests from timber harvest; provide protective buffers around trees with nests; develop critical habitat rule; work with counties to conserve habitat
Invasive animals	Competition from non-native eastern gray and fox squirrels	Monitor and control invasive animal	Conduct limited control of eastern gray and fox squirrels
Limited distribution	At risk from loss of genetic diversity, disease and demographic factors	Increase distribution	Monitoring and research of population and habitat; assess feasibility of population augmentations, and implement where feasible

Brush Prairie pocket gopher	Biology and Life History	Population	Distribution
Thomomys talpoides douglasi	Fossorial herbivore; occurs in open areas with low herbaceous vegetation.	Isolated subspecies of the northern pocket gopher; trend unknown	Limited in distribution to southcentral Clark County.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Development	loss and fragmentation of habitat	Conserve suitable habitat	Protection of prairies, meadows, grasslands; grassland restoration
Harvest and persecution	trapping by landowners and mortality by pets	Outreach and education;	Inform local residents of gopher colonies, prohibit trapping; promote non-lethal methods of damage control
Limited distribution	genetic and demographic effects of small population size, catastrophic events	Population monitoring and research	Determine status and conduct surveys to monitor presence and relative abundance
Invasive plant species	Degradation of suitable habitat	Restore degraded habitats	Remove invasive trees, scotch broom from prairie/grassland areas.

Mazama pocket gopher	**Biology and Life History**	**Population**	**Distribution**
Thomomys mazama	Fossorial herbivore; occurs in prairies, grasslands and alpine meadows; require herbs and loose, dry soil for burrowing.	Declining; several populations extinct	Occurs in the southern Puget Sound area the alpine meadowd in northern Olympic Mountains.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development	loss and fragmentation of habitat	Conserve suitable habitat	Protection of prairies; prairie/grassland restoration
Harvest and persecution	trapping by landowners and mortality by pets	Outreach and education; enforcement of existing laws	Inform local residents of gopher colonies, prohibit trapping; promote non-lethal methods of damage control
Limited distribution	genetic and demographic effects of small population size, catastrophic events	Population monitoring and research	Determine status and conduct surveys to monitor presence and relative abundance
Invasive plant species	Degradation of suitable habitat	Restore degraded habitats	Remove invasive trees, scotch broom from prairie/grassland areas.

Kincaid meadow mouse	**Biology and Life History**	**Population**	**Distribution**
Microtus pennsylvanicus kincaidi	Large vole	Poorly known.	Columbia Plateau, Grand Coulee area
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Unknown	Determine Status;	Survey for presence in potentially suitable habitat

Shaw Island Townsend's vole	**Biology and Life History**	**Population**	**Distribution**

Microtus townsendii pugeti	Shaw Island vole is smaller than other forms of Townsend's which is a larger, longer-furred vole; found in open meadow and marsh areas; feeds on succulents and herbaceous vegetation.	Poorly known	Neck Point on Shaw Island, San Juan County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	isolated, small population size; genetic and demographic effects of small, isolated populations	Determine Status	Survey for presence in potentially suitable habitat

Gray-tailed vole	**Biology and Life History**	**Population**	**Distribution**
Microtus canicaudus	Medium sized vole, limited distribution, occurs in hayfields, pastures, fallow grassy areas, and grain fields.	Common in limited area	Limited in distribution to the Willamette Valley of Oregon and Clark County, WA.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	Unknown status; lack of survey effort.	Determine status; population monitoring and research	Small mammals surveys to detect presence and define small mammal community composition in range of the gray-tailed vole.
Limited habitat, habitat loss, development, and lack of information	Demographic and genetic effects of small population size and disjunct	Habitat monitoring and research	Evaluate/model habitat based on surveys of potentially suitable areas.

Killer whale	**Biology and Life History**	**Population**	**Distribution**
Orcinus orca	Cetecean that feeds on salmon and other fish (residents and offshore ecotypes), or marine mammals (transients)	Southern resident population is 88 in May 2005; transients 300-400, trend unknown; offshore population is >350, trend uinknown.	Marine waters throughout Washinton: Pacific coast, Strait of Juan de Fuca, San Juan Islands, Haro Strait, Strait of Georgia and Puget Sound
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lower prey abundance	Reduction in salmon abundance	Restore prey populations	Rebuild depleted populations of salmon and other prey through multiple restoration activities, including management of harvest, habitat, and hatcheries.
Environmental Contamination	Known to contain high conc. of PCBs, PBDEs	Restore degraded habitats	Control and Monitor pollution in aquatic habitat; minimize risk of oil spills.
Human disturbance	Disturbance by whale-watching vessels	Education and outreach	Minimize disturbance of whales through adherence to voluntary guidelines for whale watching.

Pacific harbor porpoise	**Biology and Life History**	**Population**	**Distribution**

Phocoena phocoena	Small cetacean of shallow coastal and inland marine waters (typically <200m); prey on squid, herring and hake.	About 3,500 in inland marine waters; declined in southern Puget Sound	Occur along Pacific coast, Strait of Juan de Fuca, Strait of Georgia, San Juan Islands and Puget Sound.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Incidental mortalities through commerical fisheries	Gill netting, salmon trolls, hake trawls incidentally capture and kill porpoises	Monitor and Reseach population; Determine status	Continue efforts to reduce gill entanglement with tribal fisheries
Human disturbance	Vessel disturbance, noise and acoustic deterrent devices, and highly developed areas can displace porpoises	Monitor and Reseach population; Determine status	Periodic surveys conducted to assess presence and abundance
Environmental contamination; Oil spills	Accumulation of persistant toxins: dioxins, furans, organochlorines and heavy metals. Steady shipping traffic and associated oil spills.	Restore degraded habitats	Control and Monitor pollution in aquatic habitat; minimize risk of oil spills.

Gray wolf	**Biology and Life History**	**Population**	**Distribution**
Canis lupus	Wide ranging social carnivore, habitat generalist, relies on ungulate populations for prey, avoids humans and development.	Believed extirpated as a breeder, but occasional transients occur; may become re-established by expanding from Idaho	Limited to remote areas of North Cascades and Selkirks.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Human disturbance	Persecution through being shot or shot at, or being poisoned	Control and monitor disturbance	Enforce existing protection; outreach and education
Reduced prey resources	Reduction in important ungulate winter range	Conserve suitable habitat; habitat monitoring and research	Develop conservation protection (acquisitions, easements, agreements) for important ungulate winter range.
Habitat loss	Large highway corridors and develepment (including HWYs 20, 2, 12, and I-90) fragment suitable habitat and create barriers or impediments to movement	Restore degraded habitat	develop highway overpasses/underpasses to facilitate access to suitable habitats in central and southern Cascades. Promote forest management that improves habitat connectivity and facilitates dispersal of wolves from BC.
Limited distribution	Habitat fragmentation, and loss of important ungulate winter range.	Education and outreach	Conservation target species for ecoregional assessments which identify important areas for conservation

Grizzly bear	**Biology and Life History**	**Population**	**Distribution**
Ursus arctos	Wide ranging carnivore, avoids humans and development, low reproductive capacity.	Population is small, 0-20 bears, and is likely the periphery or periodic expansion of the BC population.	Largely restricted to remote areas of the North Cascades and Selkirks as these areas support the best habitat.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Limited distribution	Demographic and genetic effects of small population size	Enforce protected status	Population monitoring; Request reports of incidental observations.
Habitat loss	Large highway corridors and develepment (including HWYs 20, 2, 12, and I-90) fragment habitat and create barriers or impediments to movement	Restore degraded habitat	Develop highway overpasses/underpasses to facilitate access to suitable habitats. Promote forest management that improves habitat connectivity and facilitates dispersal of bears from BC.
Human disturbance	Back-country recreation (e.g., hiking, biking, motorized vehicles can disturb or displace grizzlies.	Control and monitor disturbance	Limit or restrict disturbance/access to important areas for grizzlies.

Steller sea lion	**Biology and Life History**	**Population**	**Distribution**
Eumetopias jubatus	Large pinniped, feeds on a variety of fish, occurs in coastal and inland marine waters; does not breed in WA.	Rangewide declines	Coastal and inland marine waters of WA. Distribution is focused at <10 haul outs along the coast.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limiting distribution	Vulnerable because of limited number of haul outs used/available	Monitoring and research population	Tracking movements and foraging ecology of tagged sea lions
Reduced prey resources; competition for prey resources with fisheries	Commerical fisheries may reduce important prey species	Monitoring and research of prey base	Tracking movements and foraging ecology of tagged sea lions
Incidental mortality through commercial fisheries	entanglement in gill nets and other fishery gear	Monitoring and research population	assess impact of incidental mortality
Oil spills	Limited distribution makes oil spills particularly significant	Prevention and preparation for oil spills	maintain oil spill response capabilities

Marten (coastal population)	**Biology and Life History**	**Population**	**Distribution**
Martes americana	Small to mid-sized terrestrial/arboreal carnivore, associated with older conifer forests, prey generalist, occupied lower elevation forests than Cascades populations	Possibly extirpated from the Olympic Peninsula and southwest Washington. No verifiable detections since 1991.	Historically, the distribution included the Olympic Peninsula and southwest Washington. May now be extirpated.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	Demographic and genetic effects of small population size	Determine Status	Determine and map distribution of any remaining population
Lack of information and lack of protected status.	Possible extirpation	Increase distribution	Consider future reintroduction

Fisher	**Biology and Life History**	**Population**	**Distribution**

Martes pennanti	Wide ranging, mid-sized forest carnivore, associated with older coniferous forest, prey generalist.	Extirpated	Historically found in forested areas of Western WA, northeastern WA, and the Blue Mountains. Now extirpated.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	Historical commercial trapping,	Increase distribution; Population monitoring and research	Reintroduce fishers; Monitoring release animals to evaluate reintroduction success and to determine feasibility of additional reintroductions within the historical range
Habitat loss	Loss and fragmentation of late-successional coniferous forests	Habitat monitoring and research	Evaluate habitat use and selection for reintroduced fishers at multiple scales.
Lack of information	No state-specific information on habitat associations, demography, or food habits	Population monitoring and research	Conduct research on habitat use, demography, and food habits, and methods of habitat protection.

Wolverine	**Biology and Life History**	**Population**	**Distribution**
Gulo gulo	Wide ranging mid-sized carnivore, avoids humans and develped areas, occurs in remote habitats, prey generalist, very large area requirement in relation to body size, low reproduction capacity.	Small, probably <25. Approximately 5 verifiable detections in WA since 1990.	Limited in distribution to high-elevation, remote areas of North Cascades and northeasten WA. Central Cascades may support individuals as suggested by verifiable wolverine detections in that area since 1990.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution	Effects of small population size; dependence on recruitment of dispersers from BC	Population monitoring and research; determine status; Conserve suitable habitat	protect habitat from recreational development
Habitat loss	Large highways and associated corridors (including HWYs 20, 2, 12, and I-90) fragment habitat and create barriers or impediments to movement	Restore degraded habitat	improve highway overpasses/underpasses to promote effective movement across highway corridors to facilitate access to suitable habitats in central and southern Cascades.
Human disturbance	Backcountry skiers, heli-skiers, snowmobilers, motorized vehicles can disturb or displace wolverines.	Control and monitor disturbance	Limit access to roadless, wilderness and primitive areas; prevent disturbance of known denning areas for wolverines.

Badger	**Biology and Life History**	**Population**	**Distribution**
Taxidea taxus	Fossorial carnivore; predator of other fossorial mammals, especially ground squirrels; large area requirments; inhabits shrub-steppe and other open habitats.	Very few reported caught by trappers since 1995. Apparently declining.	Historical distribution likely inlcuded most of eastern Washington from eastern Cascade foothills to Idaho. Current distribution unknown, but is limited to portions of eastern Washgington.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Lack of information	Lack information on distribution, abundance, threats, and habitat associations.	Determine status; Population monitoring and research	Study recently initiated to investigate ecology of badgers by Spokane BLM. Need to conduct badger surveys in large landscapes capable of supporting badger populations
Habitat loss	The badger's association with shrub steppe and other more open habitats places at risk to habitat loss and fragmentation via agriculture and development.	Habitat monitoring and research.	Conduct research/modelling of habitat using findings of habitat associations from the BLM study and badger surveys.

Sea otter	**Biology and Life History**	**Population**	**Distribution**
Enhydra lutris	Near shore marine carnivore; feed on urchins, crab, clams, and mussels; associated with rocky substrates and kelp; keystone species	Small but increasing; Population is the result of a reintroduction of 59 sea otters in 1969-1970	Limited in distribution to the marine waters from just south of Destruction Island north and east to Pillar Point in the Strait of Juan de Fuca.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution	Small population and limited distribution make them vulnerable to catastrophic events, disease outbreaks, and could have demographic and genetic effects.	Implement exisiting recovery plan	Annual surveys for populations trends
Environmental contaminants	Oil spills are the most threatening catastrophic event. Shipping commerceis an ongoing occurrence within the limited Washington range	Prevention and preparation for oil spills	Maintain oil spill response capabilities
Incidental mortality through commercial fisheries	entanglement in gill nets results in mortality.	Population monitoring and research	Annual surveys for populations trends
Competition for shellfish resources;	Considered competitors of fisherman for shellfish, creating fisheries mgt issues.	Outreach and education; cooperative management approaches	

Lynx	**Biology and Life History**	**Population**	**Distribution**
Lynx canadensis	Mid-sized felid. Prey specialist on snowshoe hares; physically adapted for foraging in deep snow. Strongly associated with subalpine and boreal forests.	Small population, probably <100; apparently stable. Maintenance of the WA population is likely dependent upon the demographic support from populations in BC and AB.	Eastern slope of north Cascades; Okanogan, Chelan, Ferry, Stevens and Pend Oreille Counties. Historically the species may have occurred throughout the WA Cascades.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	Demographic effects of small population size; catastrophic events such as large scale fires	Population monitoring and research	Continued surveys to determine occupancy and relative abundance in recovery zones.

Habitat loss	Habitat degraded by some silvicultural practices; roads, snowmobile trails, and natural succession, grazing; roads may facilitate winter competition with coyotes	Habitat monitoring and research; Conserve suitable habitat	Provide input on timber harvest and fire mgt activities on state, private, and federal lands to perpetuate adequate amounts and distribution of denning and foraging habitats.
Limited habitat	naturally limited to high elevation boreal forest types	Conserve suitabale habitat	Work with landowners to maintain sufficient foraging habitat, travel corridors and denning sites

Elk (Nooksack herd, mixed)	**Biology and Life History**	**Population**	**Distribution**
C.e.nelsoni, roosevelti	Large social ungulate; occurs in herds of various sizes; herds have large area requirments and have distinct summer and winter ranges.	Population is introduced from nelsoni and roosevelti stock and protected from harvest. Smallest elk herd in WA; has declined to 300 animals and has not rebounded.	Occurs in the west slope and western foothills of the north Cascades.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited habitat	Crucial winter range is limited and overlaps with private land holdings where elk may cause damage and create management conflicts	Permanent conservation of habitat; Habitat monitoring and research.	Acquisition of important winter range on private lands. Habitat quality enhancements. Minimize elk damage on private lands through compensation, special hunts and permits, fencing and other approaches.
Limited Distribution	Effects of small population size, and proximity of elk to humans and roads.	Population monitoring and research;	Habitat acquisitions and enhancements are expected to result in expanded elk distributions and increased numbers.
Harvest	Illegal harvest or unusually high winter mortality limit population growth and recovery.	Monitor and control disturbance	Habitat acquisitions may reduce or limit access thereby reducing illegal harvest. Increase enforcement could also limit illegal harvests.

Columbian white-tailed deer	**Biology and Life History**	**Population**	**Distribution**
Odocoileus virginianus leucurus	Pacific northwest coastal subspecies of White-tail; restricted in range; occupies mosaics of lowland marshes, woodlands and grasslands.	An estimated 600-700 animals WA population.	Limited to the Julia Butler Hansen National Wildlife Refuge: 5 islands in the lower Columbia River and 2000 acres of uplands near Skamokawa in Pacific County.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution based on historical harvest and habitat loss	Genetic and demographic effects of small population size, catastrophic events (floods) and proximity of deer to humans and roads.	Increase distribution; population monitoring and research; Test and monitor disease;	Refuge has acquired Crimms island and expects subpopulation there to continue to expand. Conducts predator control to reduce coyote predation of fawns.

Limited Habitat	Competition with elk for food; flooding	Conserve suitable habitat; reduce competition with elk; control water levels to prevent flooding	Extensive fencing and transplanting are used to exclude and reduce elk numbers on the refuge. Use water control structures on refuge to manage water levels in sloughs and marshes. Manage vegetation to maintain/expand a mosaic of marshes, woodlands and grasslands.

Woodland caribou	**Biology and Life History**	**Population**	**Distribution**
Rangifera tarandus	mid-sized social ungulate; associated with mature forests; depend on lichens for food especially during the winter; occur in lowland cedar and hemlock forests and higher elevation spruce and subalpine fir forests.	<50 individuals; translocations hav eoccurred with minimal success at maintaining a population.	Limited to a small portion of northeastern Pend Oreille County.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution	genetic and demograhic effects of small population size; inability of reintroduced animals to adapt to conditions in WA.	Increase distribution	A number of reintroductions have been undertaken to increase the number and distribution with little success. Source populations for further reintroductions are now unavailable.
Limited habitat	Suitable habitat may be limited by elevation and by timber management activities	Conserve suitable habitat	Protect mature forest from harvest and important calving areas.
Vulnerability to predation	Caribou appear excessively vulnerable to predation, especially by cougars	Enhanced predator management	Increase harvest of cougars in recovery areas.

Pronghorn antelope	**Biology and Life History**	**Population**	**Distribution**
Antilocapra americana	Small social ungulate of open, arid areas; occurs in shrub-steppe and steppe habitats;	Pronghorns were reintroduced in the 40s, 50s and 60s. No populations are thought to remain in the state although individuals are reported periodically. Status as an historical resident has been questioned.	Sightings of remaining individuals occur near the tri-cities area.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	lack of a viable population	Increase distribution	Feasibility study is underway which may lead to a reintroduction
Limited Habitat	Amounts and configuration of suitable habitat may not support a viable population	Conduct a reintroduction feasibility study; develop a recovery/mgt plan	Feasibility study should evaluate habitat quality, quantity and distribution.

Mountain goat	Biology and Life History	Population	Distribution
Oreamnos americanus	Mid-sized ungulate of rugged terrain; occupies steep, high elevation rock slides, cliffs, talus; uses conifer forest for cover.	Decline in some herds. Disjunct subpopulations may not act as a metapopulation. Introduced to the Olympics in the early 1900s, where they are considered an undesirable species.	Limited to high elevation areas of the Cascades, Okanogan highlands and Selkirks. Introduced population occurs in portions of Olympic National Park and National Forest.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Harvest	Over harvest or illegal harvest	Population monitoring and research; education and outreach	Monitor legal harvest, and protect populations against illegal harvest
Habitat loss	timber harvest of winter range cover, global warming	Conserve suitable habitat; protect significant areas	Protect important winter range areas from harvest or alteration.
Human disturbance	Disturbance by hikers, biker, snowmobilers and other motorized vehicles	Control and monitor disturbance; population monitoring and research; outreach and education	Use signs to inform public of sensitive areas for goats; limit access by kind and degree of activities that disturb goats.

BIRDS

Common loon	Biology and Life History	Population	Distribution
Gavia immer	Inhabits lowland lakes and reservoirs and nearshore marine waters	Rare	Breeding in north counties. Non-breeders concentrated in marine waters, but also inland freshwater bodies.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development	Residential development of lakeshores	Conserve Suitable Habitat	Protection and education programs targeting suitable breeding lakes to curtail development and recreational pressure.
Habitat Loss	Loss and degradation of suitable shoreline nesting habitat	Conserve Suitable Habitat	Protection and education programs targeting suitable breeding lakes to curtail development and recreational pressure.
Human Disturbance	Recreational boating	Education and Outreach	Education programs targeting suitable breeding lakes to curtail recreational pressure.
Water Development	Water level manipulations from hydroelectric dams	Conserve Suitable Habitat	Cooperate with Hydroelectric companies to provide floating platform nest structures where water levels fluctuate dramatically.
Environmental Contamination	Lead poisoning from lead sinkers and oil spills	Control Contaminants	Advocate use of non-toxic alternatives to lead fishing sinkers in loon areas.

Western grebe	Biology and Life History	Population	Distribution

Aechmophorus occidentalis	Inhabits lowland lakes and reservoirs and nearshore marine waters	Common to locally abundant winter visitor in saltwater, uncommon to locally common on freshwater; locally common summer breeder and migrant.	Concentrations in protected marine waters of Puget Sound during winter. Breeds in eastern Washington, primarily in the Columbia Basin.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental Contamination	Oil spills	Determine and Map Distribution	Identify winter concentration areas and incorporate into oil spill plans.
Harvest	Incidental harvest in gillnet fishery	Protect Significant Areas	Determine extent of mortality from gillnet fishery
Human Disturbance	Recreational boating near colonies may cause abandonment or gull predation	Control and Monitor Disturbance, Conserve Suitable Habitats	Identify wake-free zones near breeding colonies to minimize human disturbance.

American white pelican	**Biology and Life History**	**Population**	**Distribtuion**
Pelecanus erythrorhynchos	Inhabits deltas and sandbars of slow-flowing rivers, and breeds on lakes and impundments.	Locally uncommon to common visitor and migrant, very local breeder in eastern part of state. Rare visitor in western Washington.	Local breeder in Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Water draw-down for irrigation, hydroelectricity	Conserve Suitable Habitat	Work with stakeholders on amount and timing of water level manipulations
Human Disturbance	Human proximity and entry into breeding colonies	Control and Monitor Disturbance	Post no disturbance signs around colonies and establish colony stewardship program where needed
Harvest	Shooting because of perceived salmon predation	Population Monitoring & Research, Education and Outreach	Inter-governnmental agreements
Environmental Contamination	Pesticides and mercury	Monitor Contaminants	Reproductive success not currently impaired, but warrants periodic monitoring

Great blue heron	**Biology and Life History**	**Population**	**Distribution**
Ardea herodias	Forages in low elevation wetlands and nests in nearby woodlots	Common resident statewide, especially in Puget Sound and lower Columbia R. Uncommon to rare in mountains and in arid uplands of eastern Washington	Breeding birds concentrated near shorelines of Puget Sound in western Washington, and along Yakima R. and Columbia R. in eastern part of state.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development	Construction of buildings, subdivisions, roads and other structures near breeding colonies	Conserve Suitable Habitat, Permanent Conservation of Habitat, Education and Outreach	Protect land around large colonies through fee title or conservation easement. Inform public on minimizing disturbance during breeding period

Habitat Loss	Continued clearing of woodlands adjacent to high value foraging areas reduces heron populations	Conserve Suitable Habitat, Determine and Map Distribution, Habitat Monitoring, Permanent Conservation of Habitat	Protect land around large colonies through fee title or conservation easement. Inform public on minimizing disturbance during breeding period
Lack of Information	Forms vulnerable aggregations during breeding period	Research and Conservation	Develop standard survey protocol to monitor populations statewide
Human Disturbance	Human proximity and entry into breeding colonies	Education and Outreach	Inform public on minimizing disturbance during breeding period
Trumpeter swan	**Biology and Life History**	**Population**	**Distribution**
Cygnus buccinator	Winters in protected marine waters of northern Puget Sound and adjacent agricultural lands. Delayed maturation and low reproductive rate.	Historic decline and rebound; Up to 3,000 winter; large segment of Alaska breeding population winters around north Puget Sound; attempts to establish breeding population unsuccessful	winters around northern Puget Sound, Hood Canal, and southwestern Washington river valleys; summer at l or more isolated lakes in Spokane County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental Contamination	Lead shot poisoning from ingestion on wintering grounds	Habitat Research	Identify and remediate sources of lead poisoning
Habitat Loss	Conversion of agricultural lands	Conserve Suitable Habitat	Conservation easements on agricultural lands and wetlands
Tule greater white-fronted goose	**Biology and Life History**	**Population**	**Distribution**
Anser albifrons gambelli	Feeds on grasses and grains in agricultural fields and on tubers in wetlands, uses open water for roosting at night; nests in Arctic	Uncommon	Migrant to coastal and adjacent areas of Puget Sound, Washington's outer coast, and the lower Columbia River
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Decline in suitable habitat due to degradation and loss of marshes, and loss of upland habitat from development and changing land use practices	Permanent conservation of habitat, conserve suitable habitat, restore degraded habitats	Purchase and manage wetlands used for roosting and uplands used for foraging
Lack of information	Better information needed on population size	Determine status	Improved monitoring of this subspecies is needed in wintering areas
Environmental contamination	Use of agricultural chemicals may contaminate foraging areas	Control and monitor contamination	Monitor contamination loads in birds
Brant	**Biology and Life History**	**Population**	**Distribution**

Branta bernicla	Forages heavily on eelgrass in intertidal estuaries; nests in Arctic	Fairly common to locally abundant. Declining trend	Migrant to western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Local declines in eelgrass reduce foraging habitat	Conserve suitable habitat	Protect eelgrass beds from human activity, pollution, invasive species, and other disturbance
Human disturbance	Disturbance from increased development and greater amounts of human activity (e.g., boating) along shorelines	Protect significant areas	Restrict public use of critical wintering areas through acquisitions and easements
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills

Northern pintail	**Biology and Life History**	**Population**	**Distribtuion**
Anas acuta	Inhabits estuaries, freshwater wetlands, and agricultural fields; feeds on grains, aquatic plants, and invertebrates	Common to locally abundant in western Washington, common in eastern Washington	Migrants and wintering birds found throughout state, nests only in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Decline in suitable habitat due to degradation and loss of marshes and intertidal areas, and loss of upland habitat from development and changing land use practices	Permanent conservation of habitat. Conserve suitable habitat. Restore degraded habitats	Preserve wintering habitat through land purchase and management programs
Harvest	Vulnerable to overhunting	Manage hunting	Maintain conservative hunting regulations

Redhead	**Biology and Life History**	**Population**	**Distribution**
Aythya americana	Breeds in lakes, ponds, permanent wetlands. Winters on lakes and large rivers and westside sewage treatment ponds.	Fairly common, wintering population low.	Year-round in eastern Washington; rarely winter in western Washington; most wintering populations further south.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Continued loss and degradation of easily drained shallow wetlands. Threats in winter range include loss of aquatic vegetation for feeding.	Conserve Suitable Habitat	Protection and education programs targeting suitable breeding wetlands to curtail development and recreational pressure. Restoration of degraded habitats.
Harvest	Species can be overharvested if not regulated.	Control and Monitor Harvest	Establish and monitor hunting regulations, continue conservation regulations.

Human Disturbance	Increased recreational and industrial use of preferred habitats, recreational boating and fishing.	Education and Outreach	Education programs targeting suitable wetlands to curtail recreational pressure.

Greater scaup	**Biology and Life History**	**Population**	**Distribution**
Aythya marila	Winters in shallow nearshore waters, particularly with soft substrate and eelgrass, in open to protected embayments.	Wintering population only in WA. Fairly common, but declining statewide.	Winters in nearshore and inland waters in western Washington, some in eastern Washington. Largest densities in bays and estuaries.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental Contamination	Poor water quality affecting food sources, poor reproduction due to contaminants. Oil spills, DDE and PCBs.	Control and Monitor Contaminants	Tighten shipping contaminant regulations and industrial waste regulations. Monitor and regulate contaminent levels in cooperation with state and federal agencies.
Habitat Loss	Preferred migration stopover sites and winter habitats place species within heavily urbanized zones (degraded habitat due to contaminants and industrial and recreational activity).	Control and Monitor Disturbance and Restore Degraded Habitats	Control disturbance through regulation and enforcement, and restore degraded habitats.
Human Disturbance	Species is sensitive to nearby human activity, particularly recreational boating of all kinds.	Education and Outreach	Education programs targeting species sensitivity and suitable wintering spots in bays and estuaries.
Harvest	Species can be overharvested if not regulated.	Control and Monitor Harvest	Establish and monitor hunting regulations, continue conservation regulations.

Lesser scaup	**Biology and Life History**	**Population**	**Distribution**
Aythya affinis	Usually nests near small ponds and lakes, sedge meadows, creeks. During migration and when not breeding, found along coast in sheltered bays, estuaries, and marshes or inland on lakes, ponds, and rivers	Fairly common, historically low breeding population in state.	Breeding resident in northeastern Washington; wintering resident in western and central Washington.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Human Disturbance	Mortality from fishing nets and lines may be substantial.	Education and Outreach	Develop educational materials and programs targeted to fishermen.
Habitat Loss	Drainage of wetlands and conversion to agriculture have decreased quality and quantity of breeding and wintering habitat.	Conserve Suitable Habitat, Permanent Conservation of Habitat	Preserve wetlands through land purchase and management programs

Harvest	Species can be overharvested if not regulated.	Control and Monitor Harvest	Establish and monitor hunting regulations, continue conservation regulations.

Harlequin duck	**Biology and Life History**	**Population**	**Distribution**
Histrionicus histrionicus	Nests along fast-flowing mountainous streams, winters in marine waters. Feeds on crustaceans, molluscs, and aquatic insects	Uncommon, wintering population may be increasing	Breeds in the Olympic, Cacade, Selkirk, and Blue Mountains; winters in inland and outer coastal marine waters
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Siltation and other impacts from logging and stream alterations may impact nesting habitat and food availability; loss of rocky marine shorelines may reduce loafing sites and foraging habitat	Conserve suitable habitat	Avoid logging in riparian corridors and other changes in streams. Rocky marine shorelines should be protected.
Human disturbance	Human presence along streams can be disturbing during the nesting and brood-rearing periods	Control and monitor disturbance	Build trails and roads away from streams. Fishing, rafting, and kayaking should be limited during the nesting period
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills
Harvest	Vulnerable to overhunting	Manage hunting	Monitor harvest levels and reduce take as necessary

Long-tailed duck	**Biology and Life History**	**Population**	**Distribution**
Clangula hyemalis	Occurs in marine waters, diet consists of bottom-dwelling invertebrates and small fish, breeds in Arctic	Uncommon, declining	Marine waters of western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, development, declining prey populations	Urbanization and industrialization of coastal shorelines have degraded some winter habitat and reduced food abundance	Conserve suitable habitats, restore degraded habitats, habitat monitoring and research	Manage marine areas to reduce impacts of urbanization and industrialization, monitor prey populations
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills

Harvest	Vulnerable to overhunting	Manage hunting	Monitor harvest levels and reduce take as necessary

Black scoter	**Biology and Life History**	**Population**	**Distribtuion**
Melanitta nigra	Inhabits marine waters, feeds mainly on molluscs, nests in Canada and Alaska	Uncommon, declining	Marine waters of western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, development, declining prey populations	Urbanization and industrialization of coastal bays and estuaries have degraded some winter habitat and reduced food abundance	Conserve suitable habitats, restore degraded habitats, habitat monitoring and research	Manage marine areas to reduce impacts of urbanization and industrialization, monitor prey populations
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills
Harvest	Vulnerable to overhunting	Manage hunting	Monitor harvest levels and reduce take as necessary

Surf scoter	**Biology and Life History**	**Population**	**Distribution**
Melanitta perspicillata	Occurs in shallow marine waters and less frequently on rivers and lakes, feeds on molluscs and herring eggs, nests in Canada and Alaska	Common to abundant, declining	Widespread, especially in western marine waters
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, development, declining prey populations	Urbanization and industrialization of coastal bays and estuaries have degraded some winter habitat and reduced food abundance, commercial shellfish production has reduced access to some productive foraging areas	Conserve suitable habitats, restore degraded habitats, habitat monitoring and research	Manage marine areas to reduce impacts of urbanization and industrialization, maintain access to important feeding areas through acquisitions or easements, restore herring stocks, monitor prey populations
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills

Harvest	Vulnerable to overhunting	Manage hunting	Monitor harvest levels and reduce take as necessary

White-winged scoter	**Biology and Life History**	**Population**	**Distribution**
Melanitta fusca	Occurs in shallow marine waters, feeds on molluscs and herring eggs, nests in Canada and Alaska	Common, declining	Widespread, especially in western marine waters
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, development, declining prey populations	Urbanization and industrialization of coastal bays and estuaries have degraded some winter habitat and reduced food abundance, commercial shellfish production has reduced access to some productive foraging areas	Conserve suitable habitats, restore degraded habitats, habitat monitoring and research	Manage marine areas to reduce impacts of urbanization and industrialization, maintain access to important feeding areas through acquisitions or easements, restore herring stocks, monitor prey populations
Environmental contamination	Chemical contamination and heavy metal accumulation of winter food supplies may affect reproductive success, oil spills represent another threat	Control and monitor contamination, restore degraded habitats	Minimize sources of ongoing pollution, clean up contaminated sites, prevent oil spills
Harvest	Vulnerable to overhunting	Manage hunting	Monitor harvest levels and reduce take as necessary

Northern goshawk	**Biology and Life History**	**Population**	**Distribution**
Accipiter gentilis	Nests in mature to old timber; territory contains several nests; eat variety of birds, mammals; non-migratory in Washington	338 known territories in 2003; declined in Pugte Trough and southwest Washington	All forested regions of Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	excessive logging of mature/old timber; conversion of forest for residential development; wildfire	Protect significant areas; Conserve suitable habitat	Protect nests, and nesting and pre-fledge stands from logging; thin to reduce fire hazard in pine forest; encourage longer rotations
Lack of information	status and trend in population unknown	Population monitoring and research	Assess status and trend in populations with survyes

Ferruginous hawk	**Biology and Life History**	**Population**	**Distribution**

Buteo regalis	Nests on rock outcrops, cliffs, isolated trees; needs uncultivated lands for hunting and nesting; eats pocket gophers, ground squirrels, snakes, etc.;	Uncommon breeder; recent decline; populations decline when cultivated land exceeds 30% of area.	Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, limited habitat	Conversion of steppe to agriculture; residential development; habitat degradation by wildfire	Conserve suitable habitat;	Protect shrub-steppe habitat
Human disturbance	causes nesting failure, nest abandonment;	Protect significant sites	Protect nest sites from disturbance;
Reduced prey populations	poisoning of ground squirrels, low prey prevents reproduction	Outreach and education; restore habitat	Facilitate restoration projects; consider reclassifying some ground squirrels as Protected Wildlife

Golden eagle	**Biology and Life History**	**Population**	**Distribution**
Aquila chrysaetos	Occurs primarily in dry open forests, shrub-steppe, canyons, and alpine areas. Nests mostly on cliffs Feeds largely on marmots, jackrabbits, ground squirrels, and carrion	Locally fairly common	Breeds widely in mountainous areas of the state, especially in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Habitat loss, degradation, and fragmentation may directly golden eagle and cause declines in major prey species, especially jackrabbits and ground squirrels. Control programs for prey have contributed to decreases in food availability	Restore degraded habitats, conserve suitable habitat, conserve prey populations, control and monitor invasive species	Habitat and prey populations should be protected and increased through restoration of grasslands and shrub-steppe via reduced grazing, removal of trees and exotic vegetation, and reseeding with native grasses. Large blocks of suitable habitat should be retained. Prey populations should be conserved by reducing control programs.
Energy development	Electrocution on power lines	Eliminate human-related sources of mortality	Power lines near breeding and foraging areas should be constructed or modified to reduce electrocutions
Human disturbance	Development and activities such as rock climbing may disturb nesting birds	Control and monitor disturbance	Maintain buffer zones of no activity during nesting
Environmental contamination	Lead poisoning from ingestion of lead shot	Control and monitor contaminants	Advocate use of steel shot

Prairie falcon	**Biology and Life History**	**Population**	**Distribution**

Falco mexicanus	Nest on cliffs; depend on abundant prey in steppe and shrub-steppe; prey on horned larks, meadowlarks, other birds, small mammals.	Low density; likely declining with uncultivated habitat	Columbia Basin and surrounding foothills
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, limited habitat	Conversion of steppe to agriculture; residential development;	Conserve suitable habitat;	Protect shrub-steppe habitat
Reduced prey populations	poisoning of ground squirrels; habitat degradation by wildfire; reduced prey prevents successful reproduction	Conserve suitable habitat;	Discourage widespread control of rodents; protect shrub-stppe from fire
Human disturbance	causes nesting failure, nest abandonment;	Protect significant sites, Control and monitor disturbance	Protect nest sites from disturbance;

Greater sage-grouse	**Biology and Life History**	**Population**	**Distribution**
Centrocercus urophasianus	Inhabits shrub-steppe; mating occurs at leks	Total population holds about 1,000 birds; declining trend	Two remnant populations occur in Douglas, Grant, Yakima, and Kitittas counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Habitat loss and degradation results from large-scale fires, conversion of shrub-steppe to cropland, overgrazing, encroachment by invasive weeds, and inappropriate use of herbicides	Conserve suitable habitat, protect significant areas, restore degraded habitats	Protection and enhancement of habitat is needed, including fire prevention, continuation of Conservation Researve Program lands, and management of grazing practices and military training activities
Limited distribution	Only small isolated populations remain	Increase distribution	Improve habitat and conduct transplants to increase population sizes
Energy development	Development of wind energy projects may be harmful	Control and monitor disturbance, protect significant areas	Prevent construction of wind energy projects in areas important for sage grouse recovery
Disease	Expansion of West Nile Virus into Washington poses a threat	Test and monitor disease	Monitor the expansion of West Nile Virus into areas occupied by the species

Sharp-tailed grouse	**Biology and Life History**	**Population**	**Distribution**
Tympanuchus phasianellus	Inhabits meadow-steppe and riparian/deciduous habitats; mating occurs at leks	Total population numbers fewer than 1,000 birds; declining trend	Eight remnant populations remain in Douglas, Lincoln, and Okanogan counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Overgrazing and conversion of habitat to agriculture and pastureland	Conserve suitable habitat, protect significant areas, restore degraded habitats	Protection and enhancement of high quality habitat is needed, incuding restoration of low elevation winter sites
Limited distribution	Only small isolated populations remain	Increase distribution	Conduct transplants to increase population sizes

Energy development	Development of wind energy projects may be harmful	Control and monitor disturbance, protect significant areas	Prevent construction of wind energy projects in areas important for the species
Disease	Expansion of West Nile Virus into Washington poses a threat	Test and monitor disease	Monitor the expansion of West Nile Virus into areas occupied by sharp-tailed grouse

Mountain quail	**Biology and Life History**	**Population**	**Distribution**
Oreortyx pictus	Require tall, dense cover; brushy, riparian habitat in dry areas; brushy slopes; eat seeds, bwerries, mast,	Modest populations in scattered localities; some result from introductions; declined in recent years	Primarily Kitsap, Mason, Grays Harbor,Klickitat Counties; Also Asotin, Garfield, and Columbia counties.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss, Limited habitat	habitat degraded by overgrazing, herbicides, development	Restore degraded habitat; conserve suitable habitat	prevent grazing riparian habitat; discourage harmful forest practices

Sandhill crane (greater)	**Biology and Life History**	**Population**	**Distribution**
Grus canadensis tabida	Breeding territories contain wetlands, grassy uplands, partially forested uplands, and wet meadows. Reproductive rates are low and birds often mate for life. The Washington population winters in the Central Valley of California	Breeding population in Washington numbers only about 50 birds and is increasing. Larger numbers nest in Oregon and British Columbia	Formerly nested at a small number of sites throughout eastern Washington, but now breeds only at four locations in Yakima and Klickitat counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Wetlands and meadows may be harmed by grazing and haying practices and various water projects. Maintenance of water levels needed during breeding season	Conserve suitable habitat, restore degraded habitats, implement existing conservation plan	Protect important areas from habitat loss and degradation through acquisitions, easements, conservation agreements, and management plans. Restore wetlands and protect from harmful livestock grazing.
Water development	Drainage and damming projects in or near territories may impact breeding success	Conserve suitable habitat	Discourage water projects that impact breeding habitat
Human disturbance	Mowing may accidentally destroy nests and chicks. New road and building construction near territories may cause excessive disturbance.	Control and monitor disturbance	Prevent construction of roads and buildings within 0.5 mile of territories, discourage detrimental mowing practices during sensitive periods

Snowy plover	**Biology and Life History**	**Population**	**Distribution**
Charadrius alexandrinus nivosus	Inhabits sandy beaches and coastal dunes, some Washington birds are probably migratory	Less than 100 birds, stable	Pacific and Grays Harbor counties

General Threats	Specific Threats	Conservation Strategies	Specific Conservation Actions
Invasive plant species	Dense growth of European beachgrass reduces nesting and foraging habitat	Control and monitor invasive species	Reduce the occurrence of European beachgrass in coastal areas
Human disturbance	Beachwalkers, pets, and cars disturb and kill birds and destroy nests	Control and monitor disturbance	Expand efforts to reduce disturbance by limiting human access to areas used by plovers, restrict pets from breeding areas
Habitat loss	Cars compact beach soils, thereby reducing prey availability	Protect significant areas	Limit vehicle traffic along beaches used by birds
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging and nesting habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly

Black oystercatcher	Biology and Life History	Population	Distribution
Haematopus bachmani	Feeds on rocky marine intertidal shorelines; nests on rocks of islands, non-migratory	Small population of several hundred birds is limited by habitat	Rocky shores of outer coast, San Juan Islands, and eastern Strait of Juan de Fuca
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging and nesting habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly
Human disturbance	Fishing, kayaking, and other activity may disturb nesting birds	Control and monitor disturbance	Consider limitations on human activity near nesting sites during breeding season

Willet	Biology and Life History	Population	Distribution
Catoptrophorus semipalmatus	Occupies estuaries and sandy beaches, migratory	Rare, stable	Primarily northern Willipa Bay
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly
Development	Modifications of the Tokeland marina could eliminate a major roost site	Conserve suitable habitat	Work with local authorities to protect roosting areas in Tokeland

Upland sandpiper	Biology and Life History	Population	Distribution
Bartramia longicauda	Nests in grasslands, but uses various open habitats during migration, migratory	Very rare, no longer breeds in state	Scattered sites in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Residential development, wetland drainage, and overgrazing have reduced or degraded habitat	Conserve suitable habitat, protect significant areas	Work with private landowners to manage and restore grassland habitats

Invasive plant species	Spread of spotted knapweed has reduced habitat quality	Control and monitor invasive species	Work with private landowners to reduce spotted knapweed

Marbled godwit	**Biology and Life History**	**Population**	**Distribution**
Limosa fedoa	Forages on tidal mud flats, migratory	Probably numbers fewer than 1,000 birds, increasing	Primarily northern Willipa Bay and Grays Harbor County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly
Development	Modifications of the Tokeland marina could eliminate a major roost site	Conserve suitable habitat	Work with local authorities to protect roosting areas in Tokeland

Red knot	**Biology and Life History**	**Population**	**Distribution**
Calidris canutus	Mainly forages on intertidal flats and roosts in sandy coastal habitats;	Relatively common, rangewide declines reported	Outer coast, primarily in Pacific and Grays Harbor counties; Willapa Bay and Grays Harbor are major stopover sites along the Pacific Flyway
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Invasive plant species	Spread of *Spartina* spp. threatens habitat quality in Willapa Bay	Control and monitor invasive species	Continue programs to control and eradicate *Spartina* spp.
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly

Rock sandpiper	**Biology and Life History**	**Population**	**Distribution**
Calidris ptilocnemis	Occupies rocky shoreline habitats, migratory	Rare, with perhaps fewer than 100 birds overwintering, numbers have declined slightly in recent decades	Primarily outer coast
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly

Arctic tern	**Biology and Life History**	**Population**	**Distribution**
Sterna paradisaea	Marine waters, especially along the continental shelf; breeds on dredge-spoil and waterfront open space, mainly a passage migrant in Washington, with a tiny breeding population.	Fairly common migrant, rare breeder.	Marine waters, especially along the outer coast; a few pairs nests at Everett, Snohomish County.

General Threats	Specific Threats	Conservation Strategies	Specific Conservation Actions
Human disturbance	Any changes in management of Jetty Island, Everett, may affect nesting birds; human activity on the island and at waterfront nest locations may impact nest success	Control and monitor disturbance	Work with community officials and private businesses to manage Jetty Island for benefit of terns and to reduce disturbance during the nesting season
Environmental contamination	Oil spills may kill birds, or damage or destroy foraging and nesting habitat	Control and monitor contamination	Prevent oil spills, clean up to spills rapidly

Common murre	Biology and Life History	Population	Distribution
Uria aalge	Colonial breeder on rocks, islands, and coastal cliffs, forages in nearshore continental shelf waters and deeper inland waters	Varies between years from about 50,000-200,000 birds during winter and from about 4,000-10,000 birds during breeding season; stable	Marine waters throughout the state; breeding colonies distributed along outer coast from Clallam to Grays Harbor counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills and chronic oil pollution can kill large numbers of murres; toxic pollutants (e.g., DDTs and PCBs) may affect survival and reproduction	Control and monitor contamination	Prevent oil spills and chronic oil pollution, clean up to spills rapidly; reduce sources of ongoing toxic pollution
Harvest	Gill net fisheries result in the accidental bycatch of sizable numbers of birds	Address harvest concerns, education and outreach	Continue requirements on net design and daily and seasonal fishing activity
Human disturbance	Birds at breeding colonies are sensitive to the close approach of people, boats, and aircraft	Control and monitor human disturbance, education and outreach	Restrict human activity in and around breeding colonies
Declines in prey abundance	Commerical fisheries harvests may reduce food availability	Address harvest concerns	Manage fisheries harvests to reduce competitive impacts on seabirds
Excessive nest predation	Predation from gulls and introduced mammals at breeding colonies may impact populations	Control and monitor predators	Conduct predator control programs as necessary

Ancient murrelet	Biology and Life History	Population	Distribution
Synthliboramphus antiquus	Winter migrant to continental shelf and inland marine waters; breeds in Alaska and British Columbia, but a handful of breeding season records in Washington suggest that very small numbers may nest in the state	Fairly rare during the breeding season but common to abundant migrant and during the winter, trend unknown	Outer coast, Strait of Juan de Fuca, and northern Puget Sound
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills and chronic oil pollution can kill large numbers of murrelets	Control and monitor contamination	Prevent oil spills and chronic oil pollution, clean up to spills rapidly

Harvest	Gill net fisheries result in the accidental bycatch of sizable numbers of birds	Address harvest concerns, education and outreach	Continue requirements on net design and daily and seasonal fishing activity

Cassin's auklet	**Biology and Life History**	**Population**	**Distribution**
Ptychoramphus aleuticus	Forages along the outer continental shelf and slope and in deeper inland marine waters, nests on forested offshore rocks	Common to abundant; 90,000 estimate to nest in Washington, possibly declining	Outer coast, Strait of Juan de Fuca, and some adjacent inland marine waters
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	Oil spills and chronic oil pollution can kill large numbers of auklets	Control and monitor contamination	Prevent oil spills and chronic oil pollution, clean up to spills rapidly
Harvest	Gill net fisheries result in the accidental bycatch of sizable numbers of birds	Address harvest concerns, education and outreach	Continue requirements on net design and daily and seasonal fishing activity
Human disturbance	Birds at breeding colonies are sensitive to the close approach of people, boats, and aircraft	Control and monitor human disturbance, education and outreach	Restrict human activity in and around breeding colonies
Excessive nest predation	Predation from gulls, eagles, and other avian and mammalian predators at breeding colonies can impact populations	Control and monitor predators	Conduct predator control programs as necessary

Marbled murrelet	**Biology and Life History**	**Population**	**Distribution**
Brachyramphus marmoratus	Seabird that nests in coastal mature or old-growth forests, and younger forests with old-growth tree components; depends on availability of large platforms. Breeds solitarily and attends nests during periods of low light.	Uncommon to fairly common resident in marine waters, rare in freshwater	Nests in low to mid-elevation coniferous forests w. of Cascade crest
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Logging of old-growth forests and residential development along the coast removes nesting habitat and fragmentation of old-growth may enhance nest predation in remnant stands.	Conserve Suitable Habitat, Determine and Map Distribution, Habitat Monitoring and Research, Permanent Conservation of Habitat, Protect Significant Areas	Finalize and implement federal recovery plan. Use fee title and conservation easements to protect habitat. Use standard survey protocol to survey potential nesting habitat prior to timber harvest and follow existing federal and state statutes regarding occupancy. Identify at-sea foraging habitat as well as nearby nesting habitat and include in conservation strategy. Conduct research needed to fill gaps for developing delisting criteria.

Harvest	Gill-net fishery kills individuals and may be a significant source of mortality on Washington coastline, but limited data.	Determine and Address Limiting Factors	Evaluate potential impact of gill-net mortality in state.
Lack of Knowledge	Standard survey protocols to determine status and trends of at-sea populations	research, Natural History and Conservation	Develop standard survey protocols for determining status and trends based on at-sea counts of murrelets
Environmental Contamination	Oil spills kill individuals and have sublethal, physiological and reproductive consequences that affect local populations	Control and Monitor Contaminants	Identify important nearshore foraging areas along coast and include in oil spill response team databases for boom placement.

Tufted puffin	**Biology and Life History**	**Population**	**Distribution**
Fratercula cirrhata	Breeds over vast geographic range and extreme climatic conditions; pelagic; diet mainly of squid, euphausiids, and pelagic fishes. Breeds colonially.	Locally common breeder on n. outer coast, uncommon elsewhere in marine waters, rare s. of Admiralty Inlet. Very rare in winter.	Occurs on offshore islands along the outer coast and inland waterways from grays harbor to western Skagit and Island Counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Harvest	Gill-net fishery (both high seas drift net fisheries and coastal gill-net fisheries) kills individuals. Coastal gill-net fishery may be a significant source of mortality on Washington coastline.	Determine and Address Limiting Factors	Evaluate potential impact of gill-net mortality in state.
Lack of Information	Unknown why population sin Washington are declining	Research, Natural History and Conservation	Conduct demographic studies along coast to determine causes of 20 yr decline in populations
Environmental Contamination	Oil spills kill individuals and breeding population most at risk. Plastic pollution and ingestion at sea widespread, but detrimental affects not documented.	Control and Monitor Contaminants	Identify important nearshore foraging areas along coast and include in oil spill response team databases for boom placement.

Yellow-billed cuckoo	**Biology and Life History**	**Population**	**Distribution**
Coccyzus americanus	Onset of breeding is correlated with abundant food supply and once initiated requires only 17 d from egg-laying to fledging of young	Formerly an uncommon westside breeder, now very rare visitant statewide and may be extirpated.	Primarily riparian woodlands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Habitat Loss	Loss of suitable riparian habitat	Determine and Map Distribution; restore degraded habitat	Survey former breeding locations for occupancy to determine if extant population occurs in the state.

Flammulated owl	**Biology and Life History**	**Population**	**Distribution**
Otus flammeolus	Occupies open forests with brushy understory with high nocturnal arthropod density, low reproductive rate among owls	Uncommon to fairly common summer resident in ponderosa pine zone on e. slope Cascades, Kettle Range, Selkirk Mtns., and Blue Mtns.	Mature ponderosa pine and Douglas-fir forests in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss, Limited Habitat	Loss of nest cavities and lack of snag recruitment; degradation of foraging habitat by application of forest pesticides that kill non-target moths	Conserve Suitable Habitat, Restore Degraded Habitats	Conserve existing old-growth ponderosa pine and Douglas-fir forests, restore function to managed forests by providing functional nest cavities and foraging habitat
Lack of Information	Population status	Research, Natural History and Conservation	Conduct habitat selection studies at multiple spatial scales and evaluate demography

Burrowing owl	**Biology and Life History**	**Population**	**Distribution**
Athene cunicularia	Inhabitant of shrub-steppe and steppe; uses abandoned mammal burrows for nesting; diet of small mammals and insects; largely migratory, wintering in the southwest and Mexico	Locally fairly common to uncommon breeder in shrub-steppe in e. Washington. Rare in winter in eatsern Washington.	Shrub-steppe and grassland habitats in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss, Limited Habitat	Cultivation of grasslands and native prairies destroys nesting burrows and foraging habitat, degrades habitat quality, and may increase vulnerability to predators.	Conserve Suitable Habitat, Restore Degraded Habitats, permanent Conservation of Habitat, Education and Outreach	Work with land owners to restore native vegetation and conserve local populations of burrowing mammals around breeding colonies of owls. Implement voluntary agreements and conservation easements to conserve habitat for longterm.
Environmental Contamination	Toxic effects due to direct and indirect exposure to insecticides and pesticides on cultivated land	Control and Monitor Contaminants	Prohibit spraying of toxic chemicals within buffer around burrows and monitor compliance.

Northern spotted owl	**Biology and Life History**	**Population**	**Distribution**

Strix occidentalis caurina	Inhabits late seral coniferous forests at mid- to low-elevations; majority of pairs do not breed every year	Widespread, uncommon resident on Olympic Peninsula and in Cascade Mtns.; rare in sw Washington, and rare elsewhere awat from Cascade foothills.	Mid and late-seral closed canopy forests in western Washington and eastern Cascade slope
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Short-rotation even-aged silviculture	Conserve Suitable Habitat, Restore Degraded Habitat, Develop Recovery Plan	Preserve existing old-growth forests at landscape scale and restore habitat. Manage for and retain snags, large trees with cavities, and coarse woody debris in selectively logged forests.
Invasive species	Potential competition for habitat with barred owl	Population monitoring and research	Evaluate effect of timber harvest at landscape scale on occupancy of spotted owl habitat by barred owls

Great gray owl	**Biology and Life History**	**Population**	**Distribution**
Strix nebulosa	Can be resident or nomadic with stable and irruptive populations. Delayed maturity (commonly breeds at 3 yr)	Rare local breeder in n.c. Washington, very rare winter visitor in n. counties.	Occupies mid-seral to mature forests adjacent to meadows in eastern Okanogan and western Ferry Counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Timber harvest; intensive forestry simplifies forest structure degrading habitat.	Conserve Suitable Habitat	Develop management guidelines to protect nesting structures, restrict harvest unit size, maintain hunting perches in cutover areas.
Lack of Information	Lack of knowledge of nesting and foraging habitats and their juxtaposition	Research, Natural History and Conservation	Conduct habitat studies in occupied range and map habitat across larger area to focus additional survey work.

Vaux's swift	**Biology and Life History**	**Population**	**Distribution**
Chaetura vauxi	Nests and roosts in large diameter hollow trees in stands of high canopy closure, attaches nest to inside wall of tree cavity	Fairly common summer resident and migrant in w., uncommon in e. Widespread spring and fall migrant, locally abundant during migration.	Occurs in forests throughout the state below Alpine/Parkland and above steppe where suitable cavity trees are available
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Loss of hollow old-growth trees used as nesting and roosting sites	Conserve Habitat, Protect Significant Areas, Habitat Research	Maintain old growth forests
Lack of Information	Knowledge of population status	Research, Natural History and Conservation	Evaluate habitat selection at forest stand and landscape scales

Lewis' woodpecker	**Biology and Life History**	**Population**	**Distribution**
Melanerpes lewis	Requires snags of advanced decay for nesting, switches diet from insects in summer to acorns in winter; catches insects by flycatching and gleaning, rarely drills bark.	Locally common to uncommon summer resident, rare to locally common winter resident in e. Washington. Rare migrant and very rare winter visitor w.	Open forests and woody riparian corridors of eastern Washington in the ponderosa pine zone and below. In the Columbia Basin, occupies transition zone between ponderosa pine and sagebrush.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Fire suppression, grazing, selective timber harvesting and replanting with high densities of seedlings have degraded open ponderosa pine forests. Extent of cottonwood forests has also declined. Loss of large snags for nest sites.	Conserve Suitable Habitat	Restore open ponderosa pine forest conditions; restore natural fire regimes; maintain and recruit large diameter snags Preserve mature cottonwood riparian forests, restore natural hydrology regimes, and exclude cattle from riparian areas.
Lack of Information	Information on habitat selection at nest site, stand and landscape scales and population demography	Research, Natural History and Conservation	Conduct habitat selection studies and estimate vital rates to determine source habitats/landscapes.
Invasive Animal Species	Potential competition for nest cavities with starlings	Control and Monitor Invasive Species	Determine extent of competition for cavities and if necessary control
Development	Urbanization and residential development in breeding and overwintering habitat may result in habitat loss	Conserve Suitable Habitat	Work with county planners in establishing reserve areas of suitbale habitat

Acorn woodpecker	**Biology and Life History**	**Population**	**Distribution**
Melanerpes formicivorus	Dependent on snags for nesting and roosting, cooperative breeder, acquires prey items by gleaning and fly-catching	Very localized, uncommon resident in Klickitat Co.	Confirmed nesting only form Klickitat County.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of Information	Extent of occurrence in pine-oak woodlands in Klickitat Co.	Determine and Map Distribution	Survey oak and pine-oak woodlands in Klickitat and other counties where potentially suitbale habiat occurs to determine extent of distribution in the state at northern part of its range.

White-headed woodpecker	**Biology and Life History**	**Population**	**Distribution**

Picoides albolarvatus	Pine seeds dominate diet during most of year, flakes bark and gleans prey items, rarely drills into bark	Uncommon to locally fairly common resident in ponderosa pine forest on e. slope of cascades, ne. mountains and Blue Mtns. Very rare in w. Washington.	Occupies ponderosa pine forests in eastern Cascades and east of Okanogan River, local in Blue Mountains
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Loss of and degradation of large diameter pine forests that are needed to provide abundant and reliable seed sources and nest cavities.	Conserve Suitable Habitat, Restore Degraded Habitat	Develop conservation strategy that addresses management of pine forest types. Maintain and recruit suitable snage as nesting structures to maintain populations.
Lack of Information	Limited data on distribution	Determine and Map Distribution, Habitat Monitoring and Research, Population Monitoring and Research	research habitat needs at stand and landscape scales incorporating measures of population demography; develop methods to monitor extent of suitable source habitats using landscape imagery.

Black-backed woodpecker	**Biology and Life History**	**Population**	**Distribution**
Picoides arcticus	Irruptive species dependent on fire landscapes.	Rare to locally uncommon resident in mid to high-elevation coniferous forests e. of Cascade crest, rare w. of crest.	Primarily inhabits forests above ponderosa pine, but peripherally within ponderosa pine on east slope of Cascades. On w. side of the crest occurs in western hemlock, subalpine fir, and alpine/parkland forest types. Also occurs in Blue Mtns.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Degradation of habitat by fire suppression and loss of snags for nest sites.	Conserve Suitable Habitat, Habitat Monitoring & Research, Restore Degraded Habitats	Establish management areas where mature and old stands develop and natural processes of disease and decay occur without logging. Monitor populations to evaluate effectiveness of management areas. Allow wildfires to burn in some forests to create suitable habitat.
Lack of Information	Knowledge of population status	Research, Natural History and Conservation	Evaluate habitat selection at forest stand and landscape scales and method of tracking habitat using remote sensing techniques

Pileated woodpecker	**Biology and Life History**	**Population**	**Distribution**
Dryocopus pileatus	Dependent on large diameter snags typically in mature forest for nest and roost sites, forages in mature forest stands	Fairly common resident in coniferous forest, deciduous, and mixed forests over wide range statewide.	Below western hemlock zone in w. Washington, and below alpine/parkland zone in e. Washigton.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Habitat Loss	Timber harvest; removal of large diameter live and dead trees, downed woody material.	Conserve Suitable Habitat, Protect Significant Areas, Restore Degraded Habitats;	Evaluate whether existing management prescriptions are adequate to maintain populations.
Lack of Information	Data on population dynamics is needed to determine sustainable populations	Population monitoring and research; Research natural history and conservation	Study populations in landscapes of different forest age class distributions and amounts, and evaluate demographic parameters (vital rates, juvenile dispersal) to assess habitat conditions needed for sustainable populations.

Streaked horned lark	**Biology and Life History**	**Population**	**Distribution**
Eremophila alpestris strigata	Breeds on remnant prairie and grassland of south Puget Sound, coastal beaches and islands in the lower Columbia; winters in Oregon and on lower Columbia sites	Entire population about 330 birds in Washington, and 450 in Oregon	Local breeder in remnant grasslands in prairies and beaches of western Washingtonendmeic subspecies of Washington and Oregon; likely extinct in BC.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Loss of prairies to developement, fire suppression, and introduction of exotic plants all had or continue to be factors in decline of populations.	Conserve Suitable Habitat, Restore Degraded Habitats; Protect significant areas	Conserve and restore function to remaining prairie habitat. Develop conservation strategies with Fort Lewis,McChord Air Force Base, and area airports; protect nesting sites on public beaches
Limited Distribution	Populations have been extirpated from San Juan Islands and most of Puget Trough	Determine and Address factors Limiting Recovery, Increase Distribution	Where habitat is restored, reintroduce populations to formerly occupied sites.

Purple martin	**Biology and Life History**	**Population**	**Distribution**
Progne subis	Secondary cavity user	Primarily depends on artificial nest structures	Occurs in Puget Trough, Grays Harbor and Willapa Bay
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Invasive Animal Species	Competition for nest cavities in snags and birdhouses by European Starlings and House Sparrows	Control and Monitor Invasive Species	Trap and kill European starlings and House Sparrows near remaining and former breeding areas of martins. Install single-cavity birdhouses and gourds to enhance martin populations.

Slender-billed white-breasted nuthatch	**Biology and Life History**	**Population**	**Distribution**
Sitta carolinensis aculeata	Secondary cavity user for nest sites	Very local, rare and in decline in w. Washington	Confined to Vancouver vicinity, especially Ridgefield NWR. Rare and local in Skamania Co.; may be extirpated in Steilacoom/Fort Lewis area.

General Threats	Specific Threats	Conservation Strategies	Specific Conservation Actions
Habitat Loss	Conversion of oak and oak-conifer woodlands	Conserve Suitable Habitat	Work with landowners to incorporate conservation of this species and oak woodlands into longterm land management
Limited distribution	small size and isolation of Washington populations	Increase distribution	conduct feasibility study for reintroductions; implement translocations
Lack of Information	Current status is unclear without systematic surveys	Research, Natural History & Conservation; Determine & Address Factors Limiting Recovery	Conduct surveys where pairs were historically found, characterize habitat, and identify additional areas to target surveys. Assess factors that may account for loss of pairs at formerly occupied sites.

Pygmy nuthatch	Biology and Life History	Population	Distribution
Sitta pygmaea	One of the few cooperatively breeding passerines in North America, strong preference for long-needled pine forests	Fairly common to uncommon resident in ne. counties and along e. slope of Cascades, local in some areas.	Occupies dry, open ponderosa pine forests at low elevations in eastern Washington. Local in Blue Mtns.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Logging, fire, grazing and commercial and residential development that reduces quality of nests sites and adequate food supply	Conserve Suitable Habitat, Restore Degraded Habitats	Maintain mature and old-growth ponderosa pine. Restore degraded pine forests by thinning dense understory fir, return natural fire regime, and maintain snags.
Lack of Information	Better define the range of the species	Determine and Map Distribution	Conduct standard surveys to better define range

Western bluebird (W WA)	Biology and Life History	Population	Distribution
Sialia mexicana	Inhabits open, park-like forests and edge habitats with sufficient number of larger trees and snags to provide nest and perch sites; secondary cavity user.	Locally fairly common and widely distributed summer resident in e. Washingtion and c. and sw. Washington except for high elevation, dense forests, and the Columbia Basin	Inhabits woodland/prairie mosaic and Puget Sound Douglas-fir in w. Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	clearcut logging, fire suppression, and snag removal, as well as commercial and residential development reduce and degrade open forest and edge habitats. Competition for cavities by starlings and House Sparrows	Conserve Suitable Habitat, Restore Degraded Habitats	Conserve/restore habitat by management of snags and and using prescribed fire. Conserve habitat for primary cavity excavators in order to provide nest sites. Provide nest boxes as short term solution to cavity limitation.

Lack of Information	Monitor trend in population	Research natural history and conservation; Population monitoring & research	Conduct surveys to determine trend in population and whether listing is needed

Sage thrasher	**Biology and Life History**	**Population**	**Distribution**
Oreoscoptes montanus	Sagebrush obligate	Fairly common breeder in shrub-steppe of e. Washington.	Sagebrush and bitterbrush habitats in the Columbia Basin, north to Omak. Not present in Methow Valley and locally uncommon in Okanogan Valley.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Habitat loss to residential development, agricultural conversion, burning, herbicide and pesticide treatments, and heavy grazing by livestock. Fragmentation of remeining habitat patches.	Conserve Suitable Habitat, Restore Degraded Habitat, Protect Significant Areas	Protect core areas of good habitat; control cheatgrass; Identify degraded habitat for restoration and establish connectivity with core areas. Work with other agencies to protect and restore habitat; evaluate CRP leases to provide functional habitat on private lands.
Lack of Information	Effects of land management activities on population persistence in landscapes	Research, Natural History & Conservation	Conduct studies on use of sagebrush patches in landscapes of differing patchiness and connectivity to design conservation strategy

Loggerhead shrike	**Biology and Life History**	**Population**	**Distribution**
Lanius ludovicianus	Small avian predator; impales prey on thorns and barbed wire, an adaptation for eating large prey without the stronger feet and talons of raptors. Shrike occupies unique position in the food chain as both passerine and a top level predator.	Fairly common local summer resident in e., rare in winter.	Occurs in eastern Washington where it prefers alternating patches of shrub-steppe and grassy areas
General Threats		**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Conversion of shrub-steppe to agriculture.	Conserve Suitable Habitat, Restore Degraded habitat	Conserve existing shrub-steppe habitat and restore function of degraded shrub-steppe.

Lack of Information	Lack of knowledge of source vs sink landscapes	Research, Natural History and Conservation	Studies of populations in landscapes of varying levels of shrub-steppe amount, patchiness and connectivity with corresponding measures of demography are needed to evaluate source/sink populations and landscape characteristics.

Oregon vesper sparrow	**Biology and Life History**	**Population**	**Distribution**
Pooecetes gramineus affinis	A ground-dwelling species that breeds in dry, open habitats with short, sparse and patchy herbaceous vegetation; some bare ground; and scattering of low to moderate shrubs.	In danger of extirpation	Occupies remnant prairies and grasslands in western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss, Invasive plant species	Conversion of prairie habitat to residential development, farmland; succession to forest due to fire suppression; Scotch broom invasion	Conserve Suitable Habitat; Restore Degraded Habitat; Research, Natural History & Conservation	use easements, acquisitions, or agreements to conserve habitat; restore prairies
Lack of Information	Potential threat from herbicide and pesticide spraying	Research, Natural History and Conservation	Conduct research to evaluate potential exposure to toxins from pesticide and herbicide applications

Sage sparrow	**Biology and Life History**	**Population**	**Distribution**
Amphispiza belli nevadensis	Obligate shrub-steppe species	Uncommon migrant and summer resident in shrub-steppe of e. Washington, rare migrant w. of Cascades	Sagebrush landscapes of the Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Invasive Plant Species	Habitat degradation by cheatgrass; increased fire frequency kills native plants and depletes grass and shrub seed reservoirs while replacing native species with exotic annuals.	Conserve Suitable Habitat; Habitat Monitoring and Research	Conserve existing big sagebrush habitats from cheatgrass invasion, and develop options for management of cheatgrass to restore ecological function.
Lack of Information	Lack of knowledge about general life history and ecology of this subspecies	Population monitoring and research, Habitat Monitoring and Research	Conduct studies at landscape scales in areas of differing land management uses to determine amount, quality and connectivity of sagebrush needed to sustain populations.

Habitat Loss	Loss of big sagebrush; residential development, agricultural conversion, and road and power line rights-of-way that remove shrub-steppe habitat. Fragmentation of shrub-steppe habitat detrimental to populations.	Conserve Suitable Habitat; Restore Degraded Habitats; Research natural history and conservation	quantify effects of fragmentation of shrub-steppe habitat on sage sparrow population persistence at landscape scale. Identify areas of core habitat on public lands to function as reserves and restore function to habitat on private lands, where connectivity occurs with core habitat, through enrollment in CRP.

REPTILES

Western pond turtle	**Biology and Life History**	**Population**	**Distribution**
Actinemys (Clemmys) marmorata	Nests in grassland and open woodland around ponds	Small populations occur at handful of sites; captive bred and head-started turtles used for reintroductions and augmentation;	Puget Tough and Columbia Gorge
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development	Destruction nesting habitat; isolation of breeding ponds, road mortality	Conserve suitable habitat; protect significant areas	protect or restore nesting habitat at existing and potential sites
Invasive Animal Species	bullfrog and bass predation on hatchlings	Control and monitor introduced animals	Implement bullfrog control as needed
Limited distribution	Small number and isolation of sites	Implement recovery plan	continue reintroductions

Pygmy horned lizard	**Biology and Life History**	**Population**	**Distribution**
Phrynosoma douglasii	Inhabit shrub-steppe; bear live young in summer	Uncommon; trend unknown; extinct in BC	Columbia Basina dn Cascade foothills
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Harvest	Mortality after capture for pets	Education and outreach	discourage capture for pets
Lack if information	Trend in population and distribution largely unknown	Determine and map distribution	Record occurrence data during other activities; map locations
Habitat loss	development or conversion of habitat to agriculture	Conserve suitable habitat	

Sagebrush lizard	**Biology and Life History**	**Population**	**Distribution**
Sceloporus graciosus	Restricted to sand dune and sandy habitats with shrubs and bare ground; active on sunny days from April -October; young appear in August	Declining; small isolated populations	Columbia Basin and Okanogan

General Threats	Specific Threats	Conservation Strategies	Specific Conservation Actions
Habitat loss	conversion to agriculture	Conserve suitable habitat	
Lack of information	incomplete knowledge of distribution	Determine and map distribution	complete surveys of historic range
Limited distribution	isolated populations at risk to extinction	Protect significant sites	identify sites and protect with easements, agreements,
Invasive plants	cheatgrass degrades habitat	Restore degraded habitat	control cheatgrass at occupied sites

Racer (W WA)	Biology and Life History	Population	Distribution
Coluber constricter	Diurnal snake of grassland and talus; high fidelity to communal winter dens	Probably extirpated; no records since 1939	south Puget Sound prairies
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information		Determine and map distribution	systematic surveys to determine if any extant population

Sharptail snake	Biology and Life History	Population	Distribution
Contia tenuis	Little known; surface active in moist conditions, otherwise retreats underground under rocks and woody debris; feeds on slugs	Small isolated populations; little known	Disjunct localities in Chelan, Kittitas, Yakima, Klickitat, and Pierce counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Undocumented populations may be destroyed; conservation needs little understood	Research natural history and conservation	limiting factors need to be identified
Limited distribution	small isolated populations vulnerable to extinction	Determine and map distribution	survey and map
Habitat loss	disturbance to rock, debris, and moisture regime	Protect significant sites; conserve suitable habitat	

California mountain kingsnake	Biology and Life History	Population	Distribution
Lampropeltis zonata	Inhabits moist microhabitats in pine-oak;	Population isolated from rest of range; size and trend unknown	Skamania and Klickitat County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Harvest	Illegal collecting for pet trade	Education and enforcement	Education project in counties;
Lack of information	Habitat needs, limiting factors, largely unknown	Research natural history and conservation; Determine and map distribution	Identify habitat needs, mortality factors; survey potential habitat
Habitat loss	Development, destruction of overwintering sites	Protect significant sites	Seek easements, etc.

Limited distribution	restricted distribution and habitat needs suggest small vulnerable population	Conserve suitable habitat	

Striped whipsnake	**Biology and Life History**	**Population**	**Distribution**
Masticophis taeniatus	Found in intact shrub-steppe; diurnal; overwinters communally with other snake species; reuse hibernacula	very few records	shrub-steppe in Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Loss of sagebrush habitats	Protect significant sites; Conserve suitable habitat	Restore habitat on public land; protect other sites with easements, agreements, etc.
Lack of information	Little data on habitat needs, limiting factors	Research natural history and conservation	identify specific needs, limiting factors
Development	roadkill mortality	Identify and map sites of mortality	Develop mitigation strategy

Pacific gopher snake	**Biology and Life History**	**Population**	**Distribution**
Pituophis catenifer catenifer	Inhabited prairie and dry woodland; winters in communal dens	Probably extirpated	South Puget Sound prairies
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information		Determine and map distribution	systematic surveys to determine if any extant population

AMPHIBIANS

Tiger salamander	**Biology and Life History**	**Population**	**Distribution**
Ambystoma tigrinum	eggs and larvae in ponds in steppe and ponderosa pine; some adults remain gilled and aquatic, transformed adults spend most time underground	Locally abundant	eastern Columbia Basin, northeast Washington and Okanogan Highlands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Hybridization	Potential loss of genetic integrity due to out of state subspecies used for fish bait	Control and monitor genetic pollution	Conduct genetic work to determin extent of problem; control nonnative strains
Introduced animals	Introduced predatory fish	Control and monitor predatory fishes	enforce restrictions on transplantation of fishes
Harvest	use of larvae for fish bait		

Lack of information	Limiting factors and conservation needs largely unknown	Determine and Map distribution, Conduct research	Protect significant areas

Larch Mountain salamander	**Biology and Life History**	**Population**	**Distribution**
Plethodon larselli	Inhabits steep talus, lava tubes, or old growth timber; surface active in wet spring and fall weahter, otherwise subterranean	Population size and trends unknown	Columbia Gorge an disolated sites in the southern Washington Cascades
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	destruction of talus for roads; microclimate disruption due to overstory removal	Protect significant areas	Conserve talus and overstory of forrested talus
Lack of information	limiting factors unknown	Determine and Map distribution	

Van Dyke's salamander	**Biology and Life History**	**Population**	**Distribution**
Plethodon vendykei	Assosiacted with streams, seeps, rocks and talus; most abundant in older forest abundant woody debris, large decaying logs near streams; females brood and guard eggs.	small isolated population complexes	3 isolated populations on the Olympic Peninsula, the Willapa Hills, and the south Cascades; only in Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	impacts of timber harvest, road building, and herbicides unknown	Population monitoring and research	research life history, movements, dispersal, impacts of forest practices
Habitat loss	alteration of streams, loss of large woody debris	Protect significant areas	survey and map locations
Limited distribution	Populations may be isolated by roads, timber harvest	Conserve suitable habitat	protect streams, talus, and moist, older forest

Cascade torrent salamander	**Biology and Life History**	**Population**	**Distribution**
Rhyacotriton cascadae	Closely tied to clear cold streams, especially in splash zone; larvae in gravels in deeper water; egg to adult development may require 4.5 years	Can reach high densities in optimal habitat	west slope of southern Cascades south of Nisqually River to the Columbia
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Degradation of habitat by sediment due to logging, road building	Habitat monitoring and research	stream buffers during timber harvest;
Lack of information	Lack of data on limiting factors, life history and potential for impacts from land uses, and forest practices.	Research life history and conservation needs	identify needed conservation measures

Limited Distribution	Populations may become isolated	Determine and map distribution, Conserve suitable habitat	survey and map sites

Columbia torrent salamander	**Biology and Life History**	**Population**	**Distribution**
Rhyacotriton kezeri	Closely tied to clear cold streams, especially in splash zone; larvae in gravels in deeper water	Locally common in appropriate habitat; may be temporarily extirpated by	southwest Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Degradation of habitat by sediment due to logging, road building	Habitat monitoring and research	stream buffers during timber harvest;
Lack of information	Long term effects of forest management unknown	Research life history, movements	

Rocky Mountain tailed frog	**Biology and Life History**	**Population**	**Distribution**
Ascaphus montanus	Associated with cold, clear, rocky, streams in mature forest; eggs attached to underside of rocks in fast flowing streams.	Currenrt status of populations no known	Blue Mountains
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Degradation of habitat by sediment due to logging, road building	Habitat monitoring and research	stream buffers during timber harvest;
Lack of information	Potential effects of forest practices, roads, and grazing unknown; status and distribution data needed	Research natural history and conservation	Survey and map distribution; conduct research on impacts of land uses;

Western toad	**Biology and Life History**	**Population**	**Distribution**
Bufo boreas	Breed in ponds, lakes, and stillwater off-channle river habitats; development to metamorphosis takes about 2 months, after which toadlets disperse en masse.	Locally common, but rapid unexplained declines resulted; absent from portions of historic range	In forest, prairie and canyon grasslands throuout the state; absent from shrub-steppe regions
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Taxonomic uncertainty may mean 1 or more taxa are in greater decline; causes of declines not understood; distributional data needed	Research taxonomy, conservation	Survey and map distribution, conduct genetic studies,
Development	Roadkill mortality when moving to and from breeding sites	Conserve suitable habitat	Avoid roadbuilding near breeding sites, or provide crossings

Northern leopard frog	Biology and Life History	Population	Distribution
Rana pipiens	Breed in ponds, lakes, rivers; may stray from water in summer, but little known about habitat use.	Reduced to small areas in the Moses Lake-Potholes Reservoir and Gloyd Seeps areas	Columbia Basin, Okanogan, and northeastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Conservation needs not understood	Research natural history and conservation	research habitat needs, impacts of exotic species, movements,
Introduced animals	Predation by bullfrogs and predatory fish; habitat degradation by carp	Control and monitor introduced species	Develop methods to control or otherwise mitigate impacts of bullfrogs
Environmental contamination	agricultural chemicals	Control and monitor contaminants	evaluate need for contaminant studies

Oregon spotted frog	Biology and Life History	Population	Distribution
Rana pretiosa	Highly aquatic; extant populations inhabit large shallow wetlands assoicated with streams; breeds in seasonally flooded marginsmove underwater in winter.	Declined; only 6 populations remain	Thurston and Klickitat counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	Altered hydrology can eliminate habitat	Protect significant areas; conserve suitable habitat	protect known sites; identify and protect potential habitat
Lack of information	Potential impacts of land use, etc not understood	Research natural history and conservation	Investigate limiting factors
Introduced animals	Bullfrogs and introduced fishes	Control and monitor exotic species	Control bullfrogs and predatory fish as needed
Modification of natural processes	Loss of beaver and beaver ponds may be important	Protect natural processes	Conserve beaver populations and dynamic stream processes

Columbia spotted frog	Biology and Life History	Population	Distribution
Rana luteiventris	relatively aquatic, rarely found far from ponds, lakes, creeks; breeds in seasonally flooded margins of wetlands	Common in Okanogan and northern Cascades; declined in other states.	Most of eastern Washington, but largely absent from Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	Altered hydrology can eliminate habitat	Protect significant areas; conserve suitable habitat	protect known sites; identify and protect potential habitat
Lack of information	Potential impacts of land use, etc not understood	Research natural history and conservation; Determine and map distribution	Investigate limiting factors; survey historic sites and potential habitat
Introduced animals	Bullfrogs and introduced fishes	Control and monitor exotic species	Control bullfrogs and predatory fish as needed

FISH

Pacific lamprey	Biology and Life History	Population	Distribution
Lampetra tridentata	Juveniles spend 4-7 years as filter feeders in streams and rivers,then metamorphose and migrate to ocean. Adults parasitic on fishes for 1-2 years, migrate back to freshwater to spawn and die	Poulation size and trends unknown. Columbia River lamprey appear to be on the decline according to dam counts and anecdotal information	In Washington, distributed throughout streams and rivers of Columbia Basin up to Chief Joseph Dam, and throughout streams and rivers west of the Cascade Mountains.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Little is known about the population and trend status, but it is peceived as declining, particularly in the Columbia River System.	Determine population status and trends, and species differentiation.	Survey and map distribution. Develop methods to differentiate between species of lamprey.
Water Development	Dams and other passage barriers.	Determine what is a barrier and how to allow for fish passage.	Identify potential obstacles. Develop methods to pass barrier.
Lack of information	Although general habitat and life history requirements are known, limitiing factors and critical needs are not.	Habitat monitoring and research. Determine limiting factors.	Research habitat needs, availablity and usage. Research limiting factors, such as environmental stressors, predation and trophic relationships.

River Lamprey	Biology and Life History	Population	Distribution
Lampetra ayresii	Juveniles spend 3-6 years as filter feeders in streams and rivers, then metamorphose into adults and migrate to ocean. Adults feed on fishes for no more than 1 year, migrate back to freshwater to spawn and die.	Population size and trend unknown.	In Washington, this fish has been documented in only 6-8 coastal rivers and lakes. May occur in other coastal rivers and possibly the Columbia River System.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Little is known about the population and trend status, but it is peceived as declining.	Determine population status and trends, and species differentiation. Of our 3 lamprey species, the least is known about river lamprey.	Survey and map distribution. Develop methods to differentiate between species of lamprey.
Water Development	Dams and other passage barriers.	Determine what is a barrier and how to allow for fish passage.	Identify potential obstacles. Develop methods to pass barrier.

Lack of information	Although general habitat and life history requirements are known, limiting factors and critical needs are not.	Habitat monitoring and research. Determine limiting factors. Again, of the 3 lamprey species, the least is known about river lamprey.	Research habitat needs, availablity and usage. Research limiting factors, such as environmental stressors, predation and trophic relationships.

Margined sculpin	**Biology and Life History**	**Population**	**Distribution**
Cottus marginatus	Margined sulpin are a benthic fish inhabiting pools and glides in streams, usually over small gravel and silt. Spawning takes place in May-June. Most likely they feed on benthic invertebrates, fish eggs and young fish.	Locally common, but very restricted range.	Limited to the Walla Walla and Tucannon River drainages of SE Washington and NE Oregon.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	A restricted distribution puts it at risk to habitat disturbances or alterations.	Monitor relative abundance	Conduct relative abundance survey every few years.
Habitat loss	Logging, agriculture or other activities that elevate temperature, alter hydrology, increase sedimentation, etc.	Conserve suitable habitat.	Identify and protect all known and potential habitat within its range.

Pygmy whitefish	**Biology and Life History**	**Population**	**Distribution**
Prosopium coulteri	Reside primarily in the deeper sections of lakes, but can be found in streams. Usually found in water with temperature less than 11 degrees C. Late summer-late fall spawners in streams and lake shallows. Live for average of 4-7 years. Diet of macro-invertebrates., crustaceans and fish eggs.	Population size and trends unknown.	In Washington, currently found in 9 lakes. Historically they were known to occur in 15 lakes. Washington is at the southern end of its range.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Water temperature increases	Conserve suitable habitat.	Monitor land use practices or other developments that would increase water temperature.
Environmental contamination	Fish Piscicides	Do not use in lakes with pygmy whitefish.	Do not use piscicides in lakes with pygmy whitefish.

Limited distribution	A small, patchy distribution puts it at risk to habitat disturbances or alterations.	Monitor relative abundance.	Conduct relative abundance survey every few years.
Introduced piscivorous fish.	Bass and other piscivorous fish prey on pygmy whitefish	Control fish species introductions.	Monitor lakes for illegal introductions. Do not permit legal introductions.

Olympic mudminnow	**Biology and Life History**	**Population**	**Distribution**
Novumbra hubbsi	Three habitat requirements: little to no flow, several cm of mud substrate, and abundant aquatic vegetation. Spring spawners that build nests, but offer no parental care. Diet typical of a small, carnivorous fish consisting of crustaceans (zooplankton) , molluscs and macroinvertebrates.	Locally common, but limited distribution.	In Washington State only. Occurs in the southern and western lowlands of the Olympic Peninsula, the Chehalis and lower Deschutes River drainages, and South Puget Sound lowlands west of the Nisqually River. Populations also in the the Cherry Creek and Isaquaah Creek drainages of Snohomish and King Counties.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Wetland conversion or drainage.	Conserve suitable habitat.	Survey for mudminnows in potential sites before issuing permits.
Introduced piscivorous fish.	Bass and other piscivorous fish probably prey on Olympic mudminnows.	Control fish species introductions.	Monitor lakes and streams for illegal introductions. Do not permit legal introductions.
Limited distribution	A restricted distribution puts it at risk to habitat disturbances or alterations.	Monitor relative abundance	Conduct relative abundance survey every few years.

Leopard dace	**Biology and Life History**	**Population**	**Distribution**
Rhinichthys falcatus	Can occur in lakes and streams, preferring slow to moderate current. Associated with stone substrate covered by fine sediments. Spring spawners.	Population size and status unknown.	In Washington, a Columbia River Drainage fish. Has not been documented east of the Okanogan River. Most often in larger rivers, very few documented records for this fish.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Population status unknown.	Determine and map distribution and relative abundance.	Conduct extensive distribution and relative abundance surveys. Research effective sampling techniques.

Mountain sucker	**Biology and Life History**	**Population**	**Distribution**

Catostomus platyrhynchus	Most often found in clear, cold mountain streams, but can occur in lakes and larger rivers over sand, gravel or boulders. Utilizes areas of slow to moderate current and pools. Spawn in riffles in early summer. Diet consists almost entirely of algae and diatoms.	Population size and status unknown.	In Washington, mid and lower Columbia River drainages.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Population status unknown.	Determine and map distribution and relative abundance.	Conduct extensive distribution and relative abundance surveys. Research effective sampling techniques.

Salish sucker	**Biology and Life History**	**Population**	**Distribution**
Catostomus sp.	Mainly found in low velocity areas of streams and rivers, but also in lakes and ponds. Usually associated with sand-silt substrate and aquatic or overhanging vegetation. Spring spawners in riffles.	Population size and status unknown.	In Washington, in the Puget Trough from the Canadian border to Lake Cushman.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Population status unknown.	Determine and map distribution and relative abundance.	Conduct extensive distribution and relative abundance surveys. Research effective sampling techniques.
Loss of habitat	This fish only occurs in an area of rapid urban development. Impacts are unknown.	Conserve suitable habitat.	Determine suitable habitat.
Limited distribution	A restricted distribution puts it at risk to habitat disturbances or alterations.	Monitor relative abundance.	Conduct relative abundance survey every few years.

Westslope cutthroat	**Biology and Life History**	**Population**	**Distribtuion**
Oncorhynchus clarki lewisi	Adfluvial, fluvial and resident forms, utilizing headwater streams, rivers and lakes. Spring spawners and opportunistic feeders.	Stable	Occur in mid-Columbia River tributaries and Pend Orielle River system.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Hybridization	Hybridize readily with rainbow	Reduce or eliminate hybridization.	Avoid introduction of rainbows or only introduce sterile fish.

Inland redband trout	**Biology and Life History**	**Population**	**Distribution**
Oncorhynchus mykiss gairdneri	Cool waters of lakes, rivers and streams. Spring spawners and opportunistic feeders.	Unknown	Columbia River System.
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	Logging, agriculture or other activities that elevate temperature, alter hydrology, increase sedimentation, etc.	Conserve suitable habitat	Protect riparian areas and conduct proper land-use management

INVERTEBRATES

Columbia River tiger beetle	**Biology and Life History**	**Population**	**Distribution**
Cicindela columbica	Predatory beetle fo	May be extirpated	sandy bars along the eastern Columbia Gorge and Snake River
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat loss	dams	Conserve suitable habitat	Identify suitable habitat for possible reintroduction
Lack of formation	Distribution, biology, needs poorly known	Determine and map distribution, Research natural history and conservation	Survey historic sites and potential habitat

Siuslaw sand tiger beetle	**Biology and Life History**	**Population**	**Distribution**
Cicindela hirticollis siuslawensis	Restricted to moist sand above normal high tide on coastal beaches	unknown	Grays Harbor County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Distribution, biology, needs poorly known	Determine and map distribution, Research natural history and conservation	Survey historic sites and potential habitat, research limiting factors
Invasive plants	European beachgrass	Control and monitor invasive species	continue beachgrass control
Limited distribution	Restricted to parts of Oregon and Washington;		

Human disturbance	human and vehicle traffic	Protect significant sites	determine if protection of snowy plover and streaked horned lark nesting adequately addresses this species

Beller's ground beetle	**Biology and Life History**	**Population**	**Distribution**
Agonum belleri	Bog inhabitant; flighless	about 30 known sites	Bogs in western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Distribution, biology, need spoorly known	Determine and map distribution, Research natural history and conservation	Survey historic sites and potential habitat
Limited habitat	Isolated sites at risk of local extinction	Population monitoring and research	
Development	degrading of bogs; disruption of hydrology	Protect significant sites	protect with easements, agreements, acquiistion; fence sites whne necessary to ptoect fragile vegetation

Long-horned leaf beetle	**Biology and Life History**	**Population**	**Distribution**
Donacia idola	Bright metallic copper leaf beetle reported only from bogs; plant eating	Few known isolated populations	Sphagnum bogs of Puget Sound lowlands; Snohomish, Kitsap counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	taxonomic uncertainty, possible synonomy with *Plateumaris dubia*?	Research natural history, conservation, taxonomy; Determine and map distribution	Determine if *Donacia idola* is distinct taxon; survey additional potential sites
Limited habitat	Isolated sites at risk of local extinction	Population monitoring and research	
Development	degrading of bogs; disruption of hydrology	Protect significant sites	protect with easements, agreements, acquiistion; fence sites when necessary to ptoect fragile vegetation

Hatch's click beetle	**Biology and Life History**	**Population**	**Distribution**
Eanus hatchii	Restricted to floating Sphagnum mats;	Only 4 or 5 sites	Sphagnum bogs of Puget Sound lowlands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Distribution, biology, need spoorly known	Determine and map distribution, Research natural history and conservation	Survey historic sites and potential habitat
Limited habitat	Isolated sites at risk of local extinction	Population monitoring and research	
Development	degrading of bogs; disruption of hydrology	Protect significant sites	protect with easements, agreements, acquiistion; fence sites when necessary to ptoect fragile vegetation

Mann's mollusk-eating ground beetle	Biology and Life History	Population	Distribution
Scaphinotus mannii	Restricted to moist woodland in canyons; feeds on mollusks	Few isolated populations	Riparian woodland in tributary canyons of Snake and Grand Ronde Rivers
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Distribution, biology, needs poorly known	Determine and map distribution, Research natural history and conservation	Survey historic sites and potential habitat
Habitat loss, Limited habitat	Rural development, grazing, isolated populations at risk of extinction	Protect significant sites, restore degraded habitat, conserve suitable habitat	seek easements, management agreements, erect livestock fencing

Propertius duskywing	Biology and Life History	Population	Distribution
Erynnis propertius	Associated with gary oak (Quercus Garryana	Not uncommon where oaks remain intact	State-wide
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Habitat	Succession of oak groves	Conserve suitable habitat	Maintain oak woodland and
	to douglas-fir, habitat degradation		understory, control exotics

Oregon branded skipper	Biology and Life History	Population	Distribution
Hesperia colorado oregonia	Grasslands, glacial outwash prairies	Very irregular and rare	Western Washington Lowlands, San Juan Islands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development, invasive plant species	Invasion of exotics in grasslands,development	Conserve suitable habitat; determine status	Identify sites for protection, develop management recommendations; control invasives and exotics

Mardon skipper	Biology and Life History	Population	Distribtuion
Polites mardon	Associated with grassland/ grasses are larval foodplant	Endangered	Two disjunct areas in Washington, South Puget Sound and vicinity of Mt. Adams
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution, Habitat Loss, Invasive Plant species	Exotic grasses and weeds, grassland conversion, recreational use, inappropriate grazing, fire	Conserve suitable habitat; increase distribution	Control exotic species, determine appropriate levels of grazing, benefits of military training to maintain and enhance populations;

Dog star skipper	Biology and Life History	Population	Distribution
Polites sonora siris	grasslands, forest glades	Reduced populations in other states, status in WA unknown	Western Washington Lowlands

General Threats	Specific Threats	Conservation Strategies	Specific Conservation Actions
Habitat Loss	herbicides along roadsides, exotic species	Conserve suitable habitat; determine status	Identify limiting factors, sites for protection, and develop management recommendations

Yuma skipper	Biology and Life History	Population	Distribution
Ochlodes yuma	Found at the edges of marshes.	Extremely rare endemic	Approximately 10 localities in Grant County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution	Recreation management, park development	Protect Significant Areas	Develop management recommendations and meet with land managers

Shepard's parnassian	Biology and Life History	Population	Distribution
Parnassius clodius shepardi	Found in moist areas of canyons	Local, very rare	Southeast Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development, Invasive plant species	exotic plants, weeds, impoundments,	Determine and map distribution; conserve suitable habitat	Determine distribution, develop and implement management recommendations

Island marble	Biology and Life History	Population	Distribution
Euchloe ausonides insulanus	Grassland associate	Extremely rare	North Puget Sound
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited Distribution, Limited Habitat	Not well known	Determine and map distribution, conserve suitable habitat	Survey, determine threats to larval foodplants, occupied sites, and nectar species

Makah (Queen Charlotte) copper	Biology and Life History	Population	Distribution
Lycaena mariposa charlottensis	Found in coastal bogs	restricted distribution	Currently known from western Olympic Peninsula
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Conversion of bogs	Conserve suitable habitat, determine and map distribution	Determine appropriate strategies (fire, tree removal, etc..) to maintain habitat over time

Chinquapin hairstreak	Biology and Life History	Population	Distribution
Habrodais grunus herri	Associated with stands of golden chinquapin	Rare	Skamania County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Limited habitat	Herbicides, disease, logging	Conserve suitable habitat; determine and map distribution	Survey chinquapin stands on the Olympia Peninsula; design compatible logging strategies, inform land managers

Johnson's hairstreak	**Biology and Life History**	**Population**	**Distribution**
Mitoura johnsoni	Associated with mistletoe on western hemlock and Douglas-fir trees	Status Unknown; few known locations	Western Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Forest management	Determine and map distribution; habitat monitoring and research	Survey likely stands to determine distribution

Juniper hairstreak	**Biology and Life History**	**Population**	**Distribution**
Mitoura grynea barryi	Associated with Juniper	Few populations known	Columbia Basin
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Development	Loss of Juniper from development and nectar plant destruction from land management practices	Determine and map distribution; conserve suitable habitat	Develop management recommendations; survey for new populations

Hoary elfin (W WA)	**Biology and Life History**	**Population**	**Distribution**
Incisalia polia obscura	Prairies, heaths; larval host is kinnikinnik; flight period April-June	unknown	South Puget Sound and Kitsap Peninsula
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	fragmentation of habitat, isolation of populations		
Habitat loss, Development	loss of prairie and open woodland, degradation	Conserve suitable habitat; restore degraded habitat	

Blackmore's (Puget) blue	**Biology and Life History**	**Population**	**Distribution**
Icaricia icarioides blackmorei	Grassland associate with Lupines	Puget Trough populations isolated, uncommon	Southern Puget Sound lowlands and Olympic Mountains
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Invasive exotic plant species, habitat degradation	Conserve suitable habitat; restore degraded habitat	Manage grassland habitats to maintain Lupinus albicaulis in southern Puget Sound

Puget Sound fritillary	**Biology and Life History**	**Population**	**Distribution**

Speyeria cybele pugetensis	Inhabits grasslands and edges of oak woodlands and forest openings	Status unknown	southern Puget Sound lowlands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Development, habitat degradation, invasive species	Conserve suitable habitat; determine and map distribution, restore degraded habitat, control and monitor invasive species	Survey, identify, and protect additional sites, develop management recommendations

Oregon silverspot	**Biology and Life History**	**Population**	**Distribution**
Speyeria zerene hippolyta	Associated with coastal grasslands	Likely extirpated from Washington	Historically coastal dunes and grasslands south of Westport
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Accelerated succession due to dune stabilization, exotic species	Restore degraded habitats; increase distribution	Work to restore habitat at sites on the Long Beach Peninsula

Valley silverspot	**Biology and Life History**	**Population**	**Distribution**
Speyeria zerene bremnerii	Grasslands and forest bald associate	Highly localized	Willapa Hills, Puget Trough lowlands, and Olympic Mountains
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss	Degradation of grassland habitat	Conserve suitable habitat; restore degraded habitat; increase distribution	Identify and protect additional sites; control exotics and invasives at protected sites.

Silver-bordered fritillary	**Biology and Life History**	**Population**	**Distribution**
Boloria selene atrocostalis	True bogs and wet meadows	Status unknown	Eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Habitat Loss, Development	Wetland drainage, water table alteration; succession of wetlands	Determine and map distribution; conserve suitable habitat	Survey and monitoring; habitat management at Moxee Bog; development of state-wide habitat management recommendations

Taylor's checkerspot	**Biology and Life History**	**Population**	**Distribution**
Euphydryas editha taylori	Grassland associate in the Puget Lowlands, north Olympic Peninsula coast and San Juan Islands	Recent declines, few populations remaining	Puget Trough, including San Juan Islands and north coast of the Olympic Peninsula
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**

Habitat Loss, development, invasive plant species	Invasive species like scotch broom, exotic grasses, recreation, lack of fire	Conserve suitable habitat, restore degraded habitat, increase distribution	Improve habitat quality; reintroduce to restored habitat

Great arctic	**Biology and Life History**	**Population**	**Distribution**
Oeneis nevadensis gigas	Uncertain; probably forest openings, balds	No records since 1950	San Juan Islands
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of Information	Not known	Determine and map distribution	Surveys are needed

Sand-verbena moth	**Biology and Life History**	**Population**	**Distribution**
Copablepharon fuscum	Restricted only to sites with obligate host yellow sand-verbena	5 known sites	sandy coastal sites of northern Puget Sound
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited habitat	small isolated sites vulnerable to extinction	Protect significant sites, Conserve suitable habitat	easements, agreements, acquisitions, habitat restoration
Lack of information	Need information to enable protecting sites	Determine and map distribution	survey remaining potential sites
Invasive pant species	Scotch broom, Eurpoean beachgrass	Control and monitor invasives	assess needs and implement veg control as needed
Human disturbance	Trampling of host plants		

White-belted ringtail	**Biology and Life History**	**Population**	**Distribution**
Erpetogomphus compositus	streams and rivers	May be extirpated	Crab Creek,Grant County, and Yakima River, Benton County; northernmost extent of range
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Population monitoring	Conduct surveys, survey potential sites, dtermine if extant
Limited distribution	isolated populations at risk of extinction	Conserve suitable habitat	

Columbia (Lynn's) clubtail	**Biology and Life History**	**Population**	**Distribution**
Gomphus lynnae	PNW endemic associated with shallow muddy or gravelly rapids	May only be 1 population in Washington	Only along lower Yakima River, Benton County, Washington, and 4 counties in Oregon
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Research natural history and conservation, Population monitoring	Conduct surveys annually, survey potential sites, identify factors affecting population
Invasive animals	Carp, mosquito fish	none?	

Environmental contaminants	Agricultural chemicals may be a problem	Determine and address factors limiting recovery	Investigate chemiclas present and potential problems
Limited distribution	single population vulnerable		

Pacific clubtail	**Biology and Life History**	**Population**	**Distribution**
Gomphus kurilis	Lakes, possibly streams	2 known sites	Thurston and Skamania Counties; also Oregon and California
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Population monitoring	Conduct surveys annually, survey potential sites, identify factors affecting population
Limited distribution	isolated populations at risk of extinction	Conserve suitable habitat	

Subarctic darner	**Biology and Life History**	**Population**	**Distribution**
Aeshna subarctica	Found in bogs and marshes; lays eggs in floating moss; flight period late July-Sept	1 known site in Washngton; boreal species	Ferry County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Population monitoring	Survey potential sites, identify factors affecting population
Limited distribution	isolated populations at risk of extinction	Conserve suitable habitat	

Boreal whiteface	**Biology and Life History**	**Population**	**Distribution**
Leucorrhinia borealis	marshy ponds; flight period June-July	1 site in Washington	Okanogan County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Population monitoring	Survey potential sites, identify factors affecting population
Limited distribution	isolated populations at risk of extinction	Conserve suitable habitat	

Subarctic bluet	**Biology and Life History**	**Population**	**Distribution**
Coenagrion interrogatum		1 known site?	Ferry County,
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Lack of information	Limiting factors unknown	Determine and map distribution; Population monitoring	Survey potential sites, identify factors affecting population
Limited distribution	isolated populations at risk of extinction	Conserve suitable habitat	

California floater	**Biology and Life History**	**Population**	**Distribution**

Anodonta californiensis	A freshwater bivalve; larval stage is parasitic on fish; do not reproduce until 12 years old, may life 100 years	Past declines; current status poorly known	Columbia and Okanogan rivers; Curlew Lake, Ferry County; extirpated from much of historic range
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	dams, fluctuating water levels, decline of native host fish	Population monitoring and research	
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution
Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,
Invasive animals	competition from *Corbicula* , an Asian clam, and other invaders	Control and monitor invasives	

Western floater	**Biology and Life History**	**Population**	**Distribution**
Anodonta kennerlyi	Freshwater bivalve; larval stage is parasitic on fish	unknown	Large rivers and lakes; known from Puget Trough, Yakima and Grays Harbor counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	dams, fluctuating water levels, decline of native host fish	Population monitoring and research	
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution
Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,
Invasive animals	competition from *Corbicula* , an Asian clam, and other invaders	Control and monitor invasives	

Winged floater	**Biology and Life History**	**Population**	**Distribution**
Anodonta nuttalliana	Freshwater bivalve; larval stage is parasitic on fish	unknown	Large rivers and reservoirs
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	dams, fluctuating water levels, decline of native host fish	Population monitoring and research	
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,

Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Invasive animals	competition from *Corbicula* , an Asian clam, and other invaders	Control and monitor invasives	

Oregon floater	**Biology and Life History**	**Population**	**Distribution**
Anodonta oregonensis	Freshwater bivalve; larval stage is parasitic on fish	unknown	Large rivers and lakes;King and Whatcom counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Water development	dams, fluctuating water levels, decline of native host fish	Population monitoring and research	
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,
Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Invasive animals	competition from *Corbicula* , an Asian clam, and other invaders	Control and monitor invasives	

Western ridged mussel	**Biology and Life History**	**Population**	**Distribution**
Gonidea angulata	Freshwater bivalve; larval stage is parasitic on fish	unknown	Streams
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution
Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,

Western pearlshell	**Biology and Life History**	**Population**	**Distribution**
Margaritifera falcata	Freshwater bivalve; requires cold, well oxygenated, low gradient streams with gravel/sand bottom; larva are parasitic on salmonids	Widespread declines; formerly very abundant;	Streams in Puget Trough, and scattered localities in eastern Washington
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Harvest	illegal collection for pearl industry	Education and enforcement	
Environmental contamination	pollution, sedimentation	Control and monitor contaminants	reduce sedimentation and pollution

Limited distribution	may be reduced to isolated populations	Determine and map current distribuion; Increase distribution; Restore habitat;	investigate opportunities for reintroductions
Lack of information	current distribution poorly known; taxonomic uncertainty; limited data on demographics and biology	Research life history, conservation, taxonomy	Support surveys, taxonomic and life history studies,

Bluegray taildropper	**Biology and Life History**	**Population**	**Distribution**
Prophysaon coeruleum	Associated with moist forest floor conditions; abundant coarse woody debris; bigleaf maple	A few isolated populations; a rare regional endemic	scattered sites in Puget Trough; extant populations in Lewis and Cowlitz counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	isolated populations vulnerable	Increase distribution	Attempt experimental reintroduction?
Habitat loss	logging, development	Protect significant sites; Conserve suitable habitat	easements, agreements
Lack of information	life history, habitat needs, etc. poorly understood	Determine and map distribution; Population monitoring and research	survey potential sites; monitor known sites research life history, habitat needs

Crowned tightcoil	**Biology and Life History**	**Population**	**Distribution**
Pristiloma pilsbryi	Terrestrial snail found in decaying leaf litter in salal	May be extinct	1 locality, Pacific County
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	isolated populations vulnerable	Increase distribution; Protect significant sites; Conserve suitable habitat	Attempt experimental reintroduction?; easements, agreements
Lack of information	Taxonomic uncertainty, may be synonymous with more widespread species; life history, habitat needs, etc. unknown	Determine and map distribution; Population monitoring and research; research taxonomy	survey potential sites; ressearch life history, habitat needs

Oregon megomphix	**Biology and Life History**	**Population**	**Distribution**
Megomphix hemphilli	Terrestrial snail of moist harwood/conifer forest; often associated with bigleaf maple and large woody debris	Few isolated populations; extinct at some historic sites	Regional endemic; Scattered localities from Olympia to Columbia River; Thurston, Lewis, Grays Harbor and Cowlitz counties
General Threats	**Specific Threats**	**Conservation Strategies**	**Specific Conservation Actions**
Limited distribution	isolated populations vulnerable to logging, flooding, fires	Increase distribution	Attempt experimental reintroduction?
Habitat loss	logging, development	Protect significant sites; Conserve suitable habitat	easements, agreements

Lack of information	life history, habitat needs, etc. poorly understood	Determine and map distribution; Population monitoring and research	survrey potential sites; monitor known sites; research life history, habitat needs